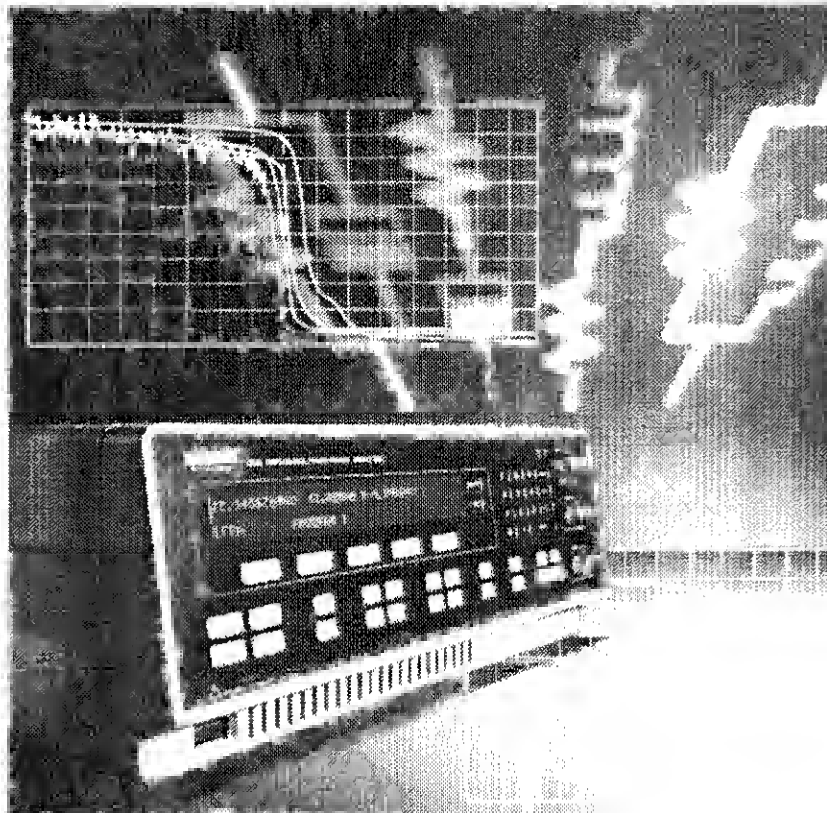


# 1255 & 1260 Frequency Response Analyzer & Impedance/Gain-Phase Analyzer



## MAINTENANCE MANUAL Volume 2

# Chapter 7

## Mechanical Details

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## 1 GENERAL

This chapter contains disassembly procedures for the 1255/60. Generally speaking, the instruments can be re-assembled simply by reversing these procedures. Both instruments are designed such that access to the pcbs and other major components is straightforward. Cautionary notes are given where necessary.

## 2. PCB LOCATIONS

Pcbs for the 1255 and 1260 instruments are located as shown in Figs. 7.1 and 7.2 respectively.

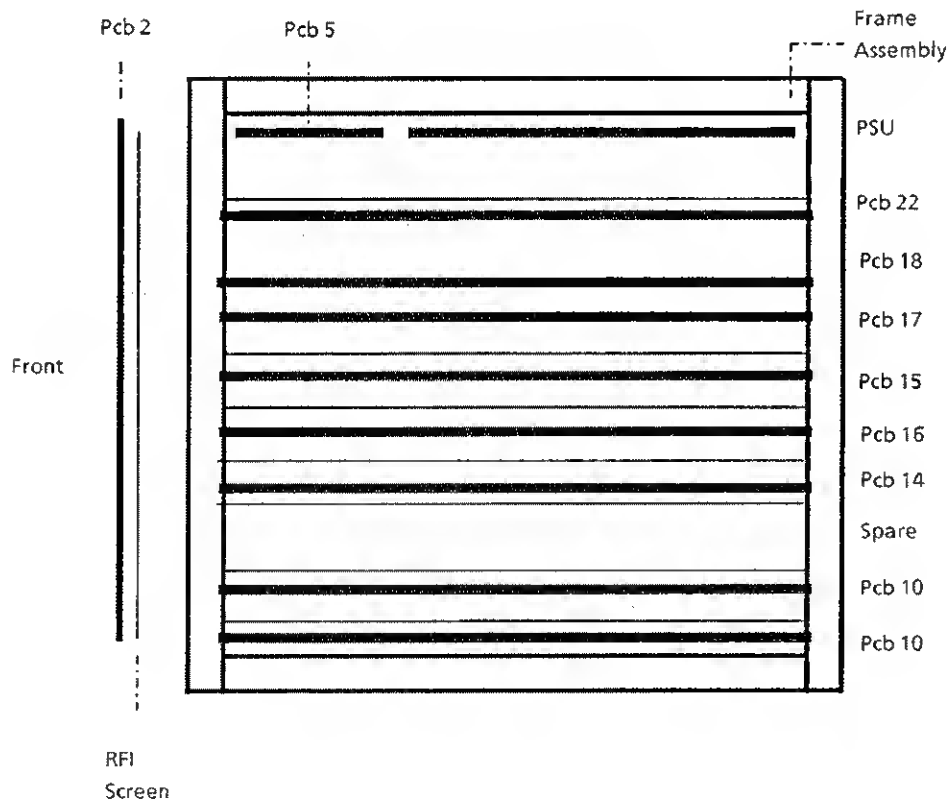


Fig. 7.1 1255 PCB Locations

### 3.1 TOP COVER REMOVAL

Refer to Fig. 7.3

To remove the top cover:

1. Remove two rear corner screws 'A'
2. Remove two trim screws 'B' from each side trim and remove trims 'C'.
3. Lift off top cover.

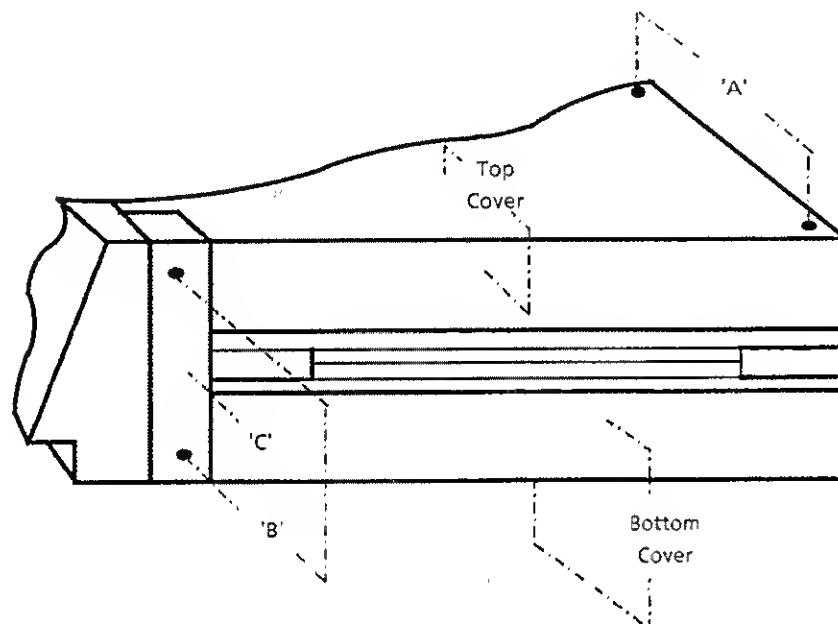


Fig. 7.3 Top Cover Removal

### 3.2 BOTTOM COVER REMOVAL

To remove the bottom cover:

1. Carefully invert the instrument.
2. Remove three fixing screws, one at each rear corner and one in the centre of the front edge.
3. Lift off bottom cover

#### 4.1 PCB 2, FRONT PANEL INTERFACE

Refer to Fig 7.5

To remove this board from the 1255 front panel assembly, first detach the front panel assembly (Sect. 3.3) then proceed as follows:

1. Remove the two screws 'E' securing the L.H. bracket and remove bracket.
2. Remove the seven nuts 'F', carefully lift the RFI screen a short distance from the pcb, then disconnect the 'beeper' before removing the screen fully

During assembly re-connect the beeper before positioning the screen. Ensure also that the insulated side of the screen faces the pcb.

3. Remove a further seven nuts and spacers, then lift the pcb clear of its mounting studs before disconnecting the ribbon cable to the membrain keyboard.

The removal of pcb 2 will expose the display tube. Take care not to damage the vacuum seal which is normally protected by a detachable plastic cover.

Note. To remove pcb 2 from the 1260, first remove pcb 31 as per Sect. 4.2.

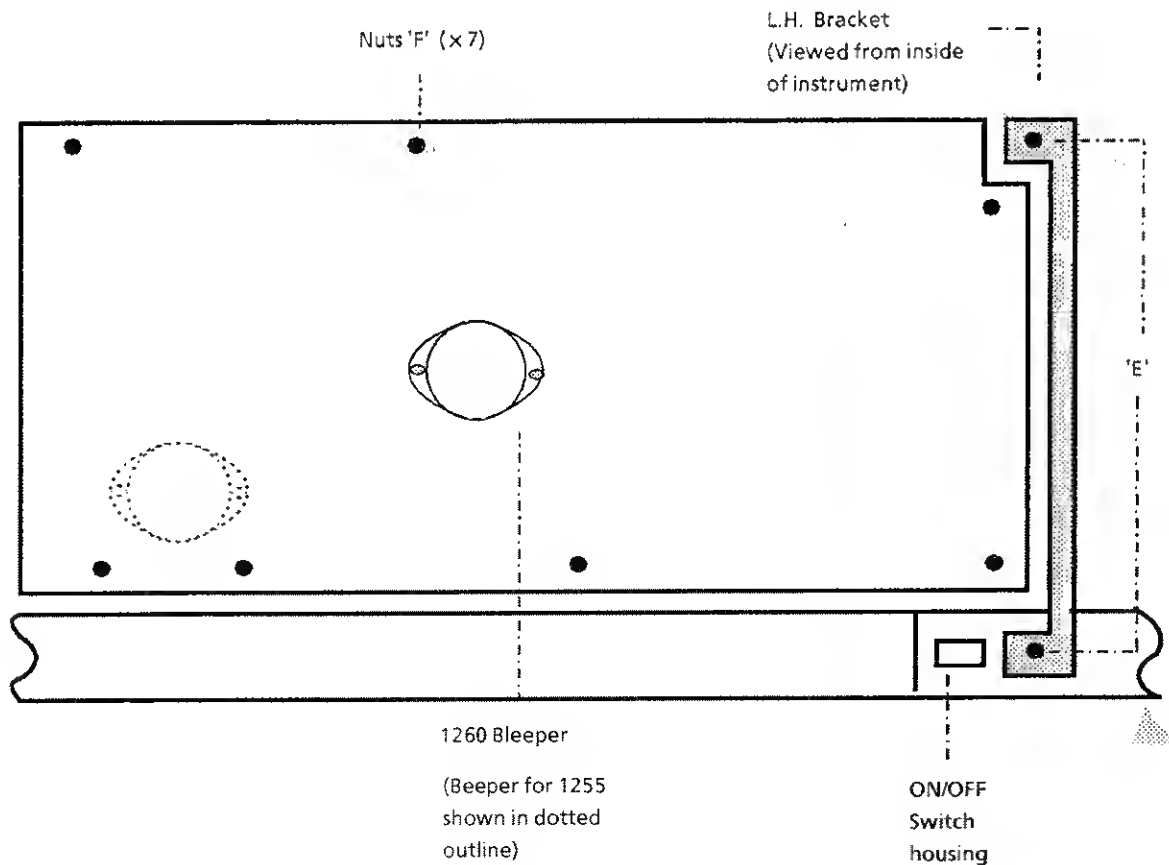


Fig 7.5 Removal of Front Panel Interface

#### 4.4 FAN REMOVAL

To remove the fan:

1. Remove top and bottom covers, as described in Sections 3.1 and 3.2.
2. Remove, from either side, the two screws labelled 'H' in Fig. 7.7
3. Pull the rear panel clear to access the three nuts securing the fan.
4. Remove the nuts and lift the fan clear.

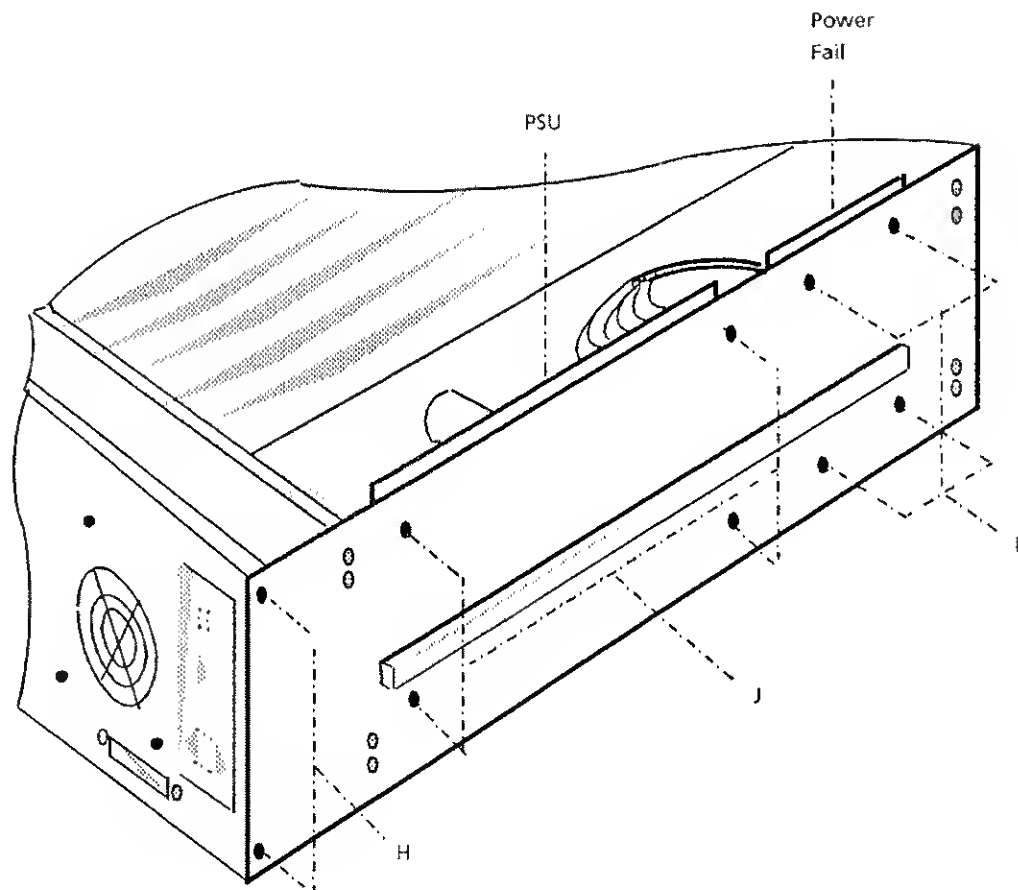


Fig 7.7 Component Removal/Wiring

#### 4.5 PCB 5 (POWER FAIL) REMOVAL

To remove pcb 5 it will first be necessary to remove top and bottom covers as described in Sections 3.1 and 3.2.

Board 5 is fixed to the left-hand side panel, just in front of the power supply unit. The pcb is supported on six stand-offs. These have spring barbs which can be squeezed to allow the pcb to be slipped over for removal.

A more convenient method may be to remove the four screws labelled 'T' in Fig 7.7, then slip the pcb off the two centre stand-offs by squeezing the barbs. (Hold the stand-off bodies to prevent them turning),

#### 4.6 POWER SUPPLY REMOVAL

The power supply is mounted on the left-hand side panel of the instrument.

To remove the power supply:

1. Remove both halves of the cover, as described in Sections 1 and 4.
2. Remove the four screws labelled 'J' in Fig 7.7.
3. Disconnect the supply leads and lift the power supply module clear.

The mains wiring details are shown in Fig 7.8. There are also six output leads from the "FASTON" terminals to the motherboard. These six connections are clearly identified, both at source and destination. Note that there is no connection to the -5V terminal.

#### 4.7 THE MOTHERBOARD

To remove the motherboard:

1. Remove both halves of the cover, as described in Sections 3.1 and 3.2.
2. Detach the front panel assembly, as described in Section 3.3.
3. Disconnect the fly-leads from the "FASTON" terminals on the motherboard.
4. Turn the unit upside-down and remove the twenty-two fixing screws, plus two more which secure the lower cover front screw mounting plate.
5. Remove the motherboard from the instrument.

# Chapter 7

## Mechanical Details

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*Fig.*

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7.7 Component Removal	7.9

## 1 GENERAL

This chapter contains disassembly procedures for the 1255/60. Generally speaking, the instruments can be re-assembled simply by reversing these procedures. Both instruments are designed such that access to the pcbs and other major components is straightforward. Cautionary notes are given where necessary.

## 2. PCB LOCATIONS

Pcbs for the 1255 and 1260 instruments are located as shown in Figs. 7.1 and 7.2 respectively.

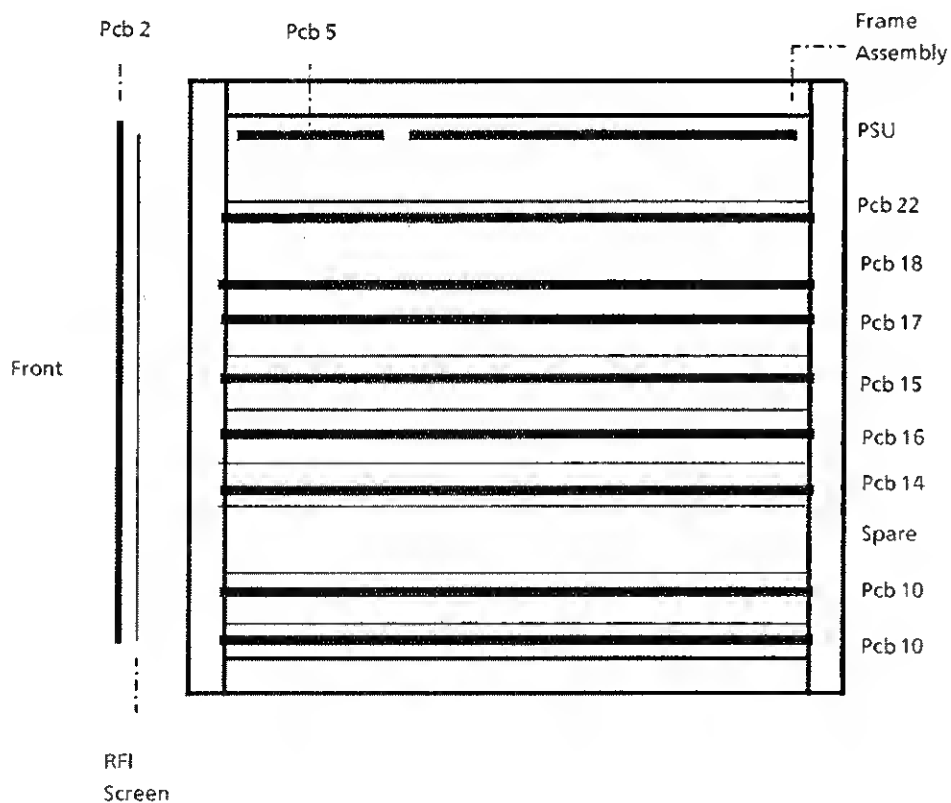


Fig. 7.1 1255 PCB Locations

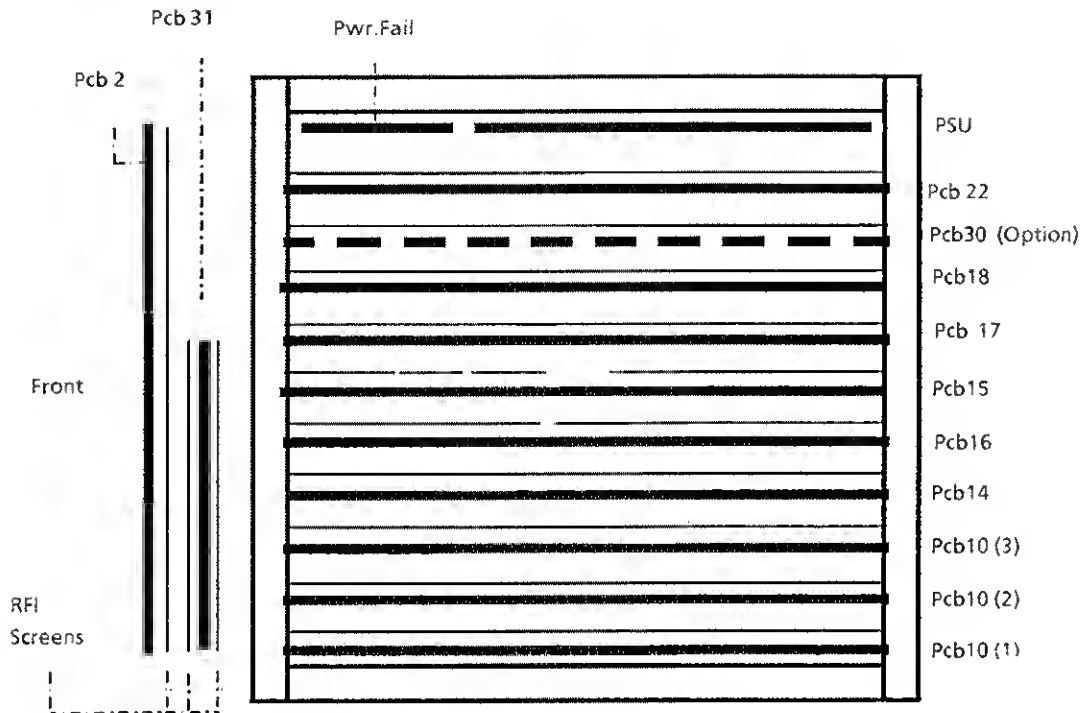


Fig. 7.2 1260 PCB Locations

### 3 ACCESS TO PCBs AND COMPONENTS

To gain access to pcbs and other components, it will be necessary to remove the instrument trims and covers (Sections 3.1 to 3.2 refer). Removing only the top cover will allow access to most pcbs. To remove the motherboard and the power supply unit (PSU) the bottom cover must also be removed. With 1255, the display board (pcb 2) can be removed once the front panel assembly has been detached (Section 3.3 refers). On the 1260, it will be necessary to first remove pcb 31 before attempting to remove pcb 2. The removal of pcb 31 is described in Section 4.2.

### 3.1 TOP COVER REMOVAL

Refer to Fig. 7.3

To remove the top cover:

1. Remove two rear corner screws 'A'
2. Remove two trim screws 'B' from each side trim and remove trims 'C'.
3. Lift off top cover.

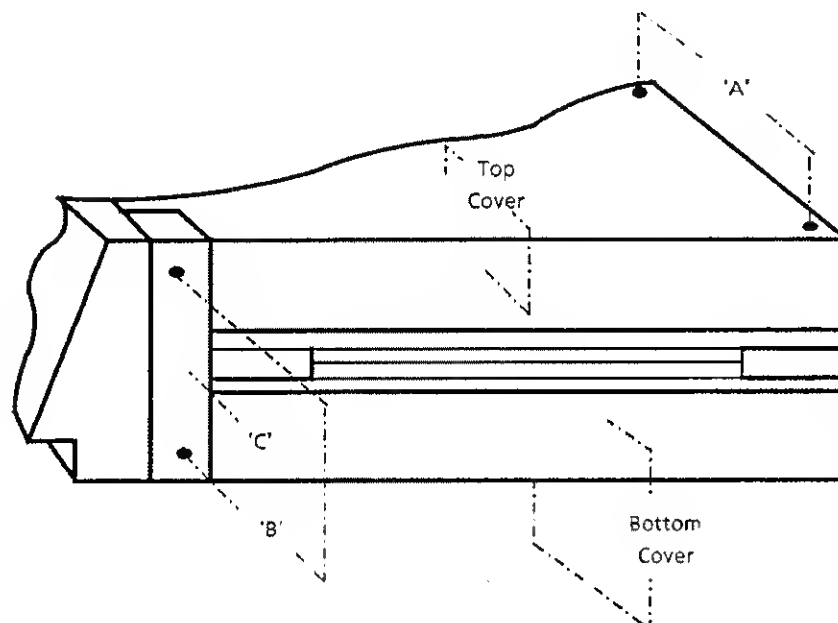


Fig. 7.3 Top Cover Removal

### 3.2 BOTTOM COVER REMOVAL

To remove the bottom cover:

1. Carefully invert the instrument.
2. Remove three fixing screws, one at each rear corner and one in the centre of the front edge.
3. Lift off bottom cover

### 3.3 DETACHING FRONT PANEL ASSEMBLY

Refer to Fig. 7.4.

With the top cover removed (Sect.3.1):

1. Remove screws 'D' from both sides of the instrument.
2. Withdraw the complete front panel assembly from the main body of the instrument.
3. To remove the assembly completely, unplug the cable from the DIL socket then disconnect the five fly-leads (seven for 1260) noting the terminals from which they were disconnected (Refer to the Note in Sect. 4).

**Take care not to damage the ON/OFF switch arm which is exposed when the front panel assembly is removed.**

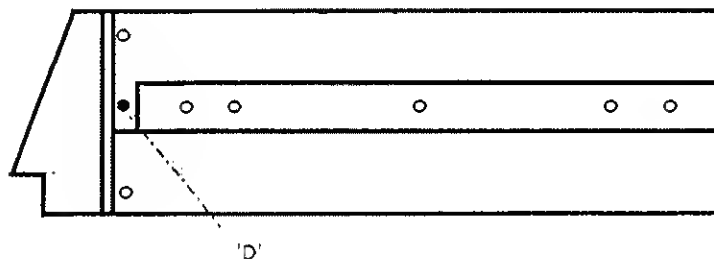


Fig 7.4 Removal of Front Panel Assembly

## 4. PCB REMOVAL

Once the top cover has been removed, most pcbs within the frame assembly can be unplugged from the instrument motherboard simply by raising the two plastic ejector levers on the pcb top edges. First, disconnect any board-to-board fly leads. Sub miniature connectors (SMCs) from pcb 10 (V Hi/Lo) and pcb 16 (Gen. output) to the front panel must also be disconnected before removing these boards.

To ensure correct connections on re-assembly, note carefully the source and destination of each of these cables before disconnecting, paying special regard to pcb 10. With the pcbs in situ, the uppermost leads are the Hi input and the lower leads the Lo input. These should be mated with corresponding channel connectors on the front panel. By convention, the outermost board 10 within the frame assembly, is designated channel 1, the next channel 2, and so on.

#### 4.1 PCB 2, FRONT PANEL INTERFACE

Refer to Fig 7.5

To remove this board from the 1255 front panel assembly, first detach the front panel assembly (Sect. 3.3) then proceed as follows:

1. Remove the two screws 'E' securing the L.H. bracket and remove bracket.
2. Remove the seven nuts 'F', carefully lift the RFI screen a short distance from the pcb, then disconnect the 'beeper' before removing the screen fully

During assembly re-connect the beeper before positioning the screen. Ensure also that the insulated side of the screen faces the pcb.

3. Remove a further seven nuts and spacers, then lift the pcb clear of its mounting studs before disconnecting the ribbon cable to the membrain keyboard.

The removal of pcb 2 will expose the display tube. Take care not to damage the vacuum seal which is normally protected by a detachable plastic cover.

Note. To remove pcb 2 from the 1260, first remove pcb 31 as per Sect. 4.2.

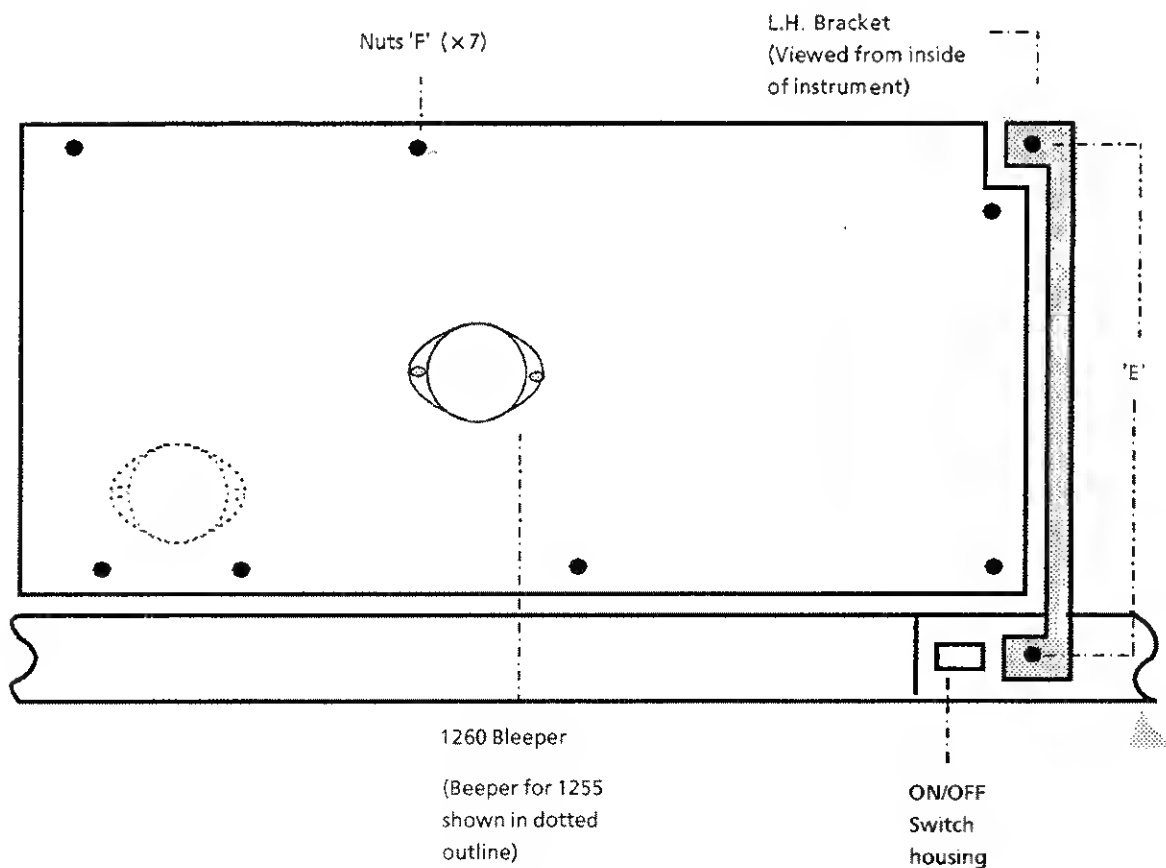


Fig 7.5 Removal of Front Panel Interface

#### 4.2 PCB 31, CURRENT-TO-VOLTAGE CONVERTER (1260)

Refer to Fig. 7.6

To remove pcb 31 from the 1260 front panel assembly:

1. Disconnect the sub-miniature connection (SMC) at the front panel assembly, to board 10.
2. Disconnect both the 2-pin twisted pair and the 4-way Amphenol connectors to board 15.
3. Remove the 3 pan-head screws 'G', securing the top RFI screen on pcb 31 and remove the screen.
4. Remove 4 nuts and washers holding the pcb and bottom RFI screen to the support posts.
5. Remove 3 pan-head screws securing bottom screen to pcb 2 and remove pcb.

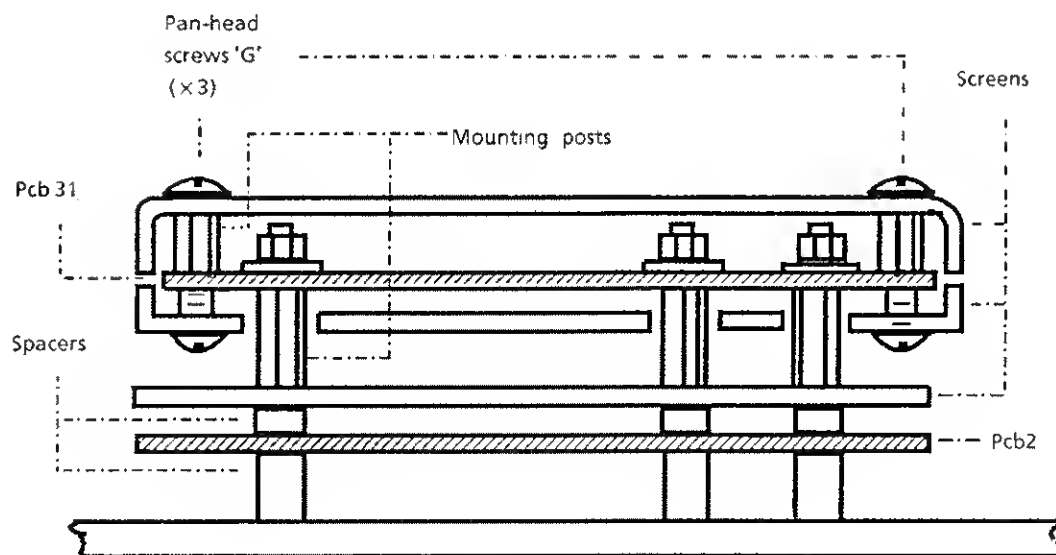


Fig 7.6 Pcb 2 and 31 on Front Panel Assembly.

#### 4.3 MEMBRANE SWITCH PANEL

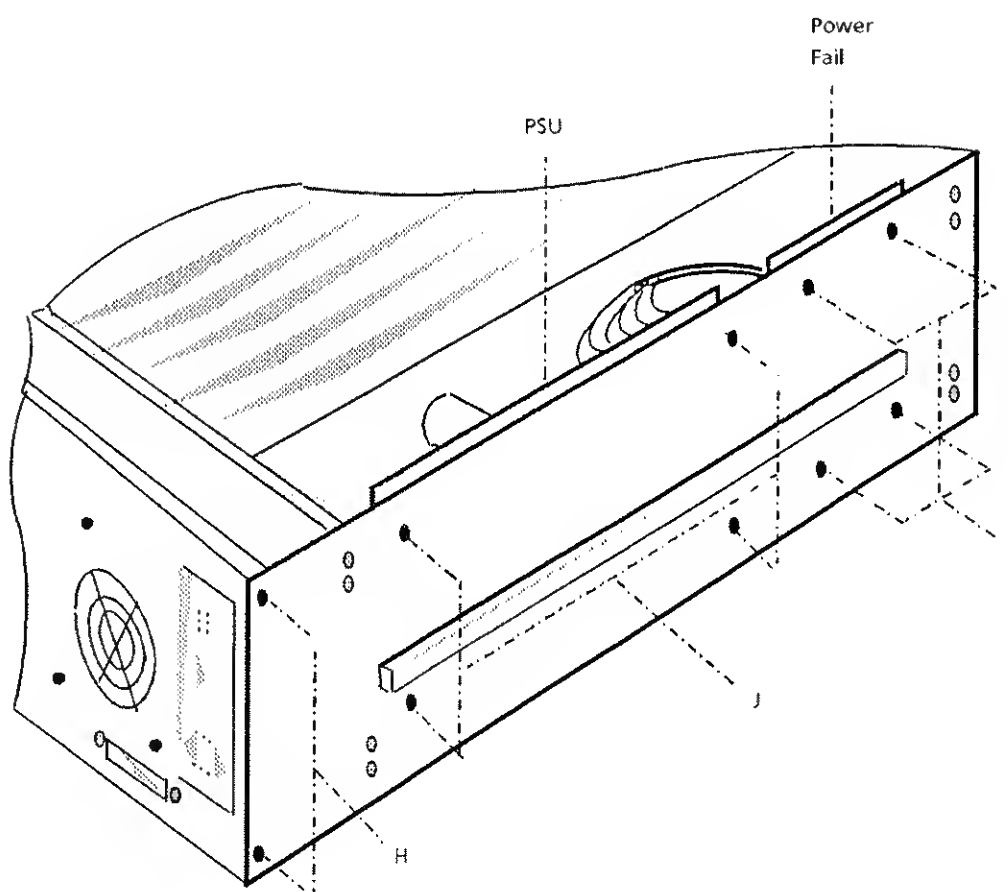
To remove the membrane switch panel from the front panel assembly:

1. Remove pcb 2 (31 and 2 for 1260) as described in Sect. 4.1 (4.2 and 4.1)
2. Remove the 8 nuts which connect the membrain switch panel to the front moulding.
3. Withdraw the switch panel, complete with studs and BNC connectors, from the front of the assembly.

#### 4.4 FAN REMOVAL

To remove the fan:

1. Remove top and bottom covers, as described in Sections 3.1 and 3.2.
2. Remove, from either side, the two screws labelled 'H' in Fig. 7.7
3. Pull the rear panel clear to access the three nuts securing the fan.
4. Remove the nuts and lift the fan clear.



**Fig 7.7** *Component Removal/Wiring*

#### 4.5 PCB 5 (POWER FAIL) REMOVAL

To remove pcb 5 it will first be necessary to remove top and bottom covers as described in Sections 3.1 and 3.2.

Board 5 is fixed to the left-hand side panel, just in front of the power supply unit. The pcb is supported on six stand-offs. These have spring barbs which can be squeezed to allow the pcb to be slipped over for removal.

A more convenient method may be to remove the four screws labelled 'T' in Fig 7.7, then slip the pcb off the two centre stand-offs by squeezing the barbs. (Hold the stand-off bodies to prevent them turning),

Disconnect the board and lift it clear. The wiring connections to the Power Fail pcb are shown in Fig 7.8.

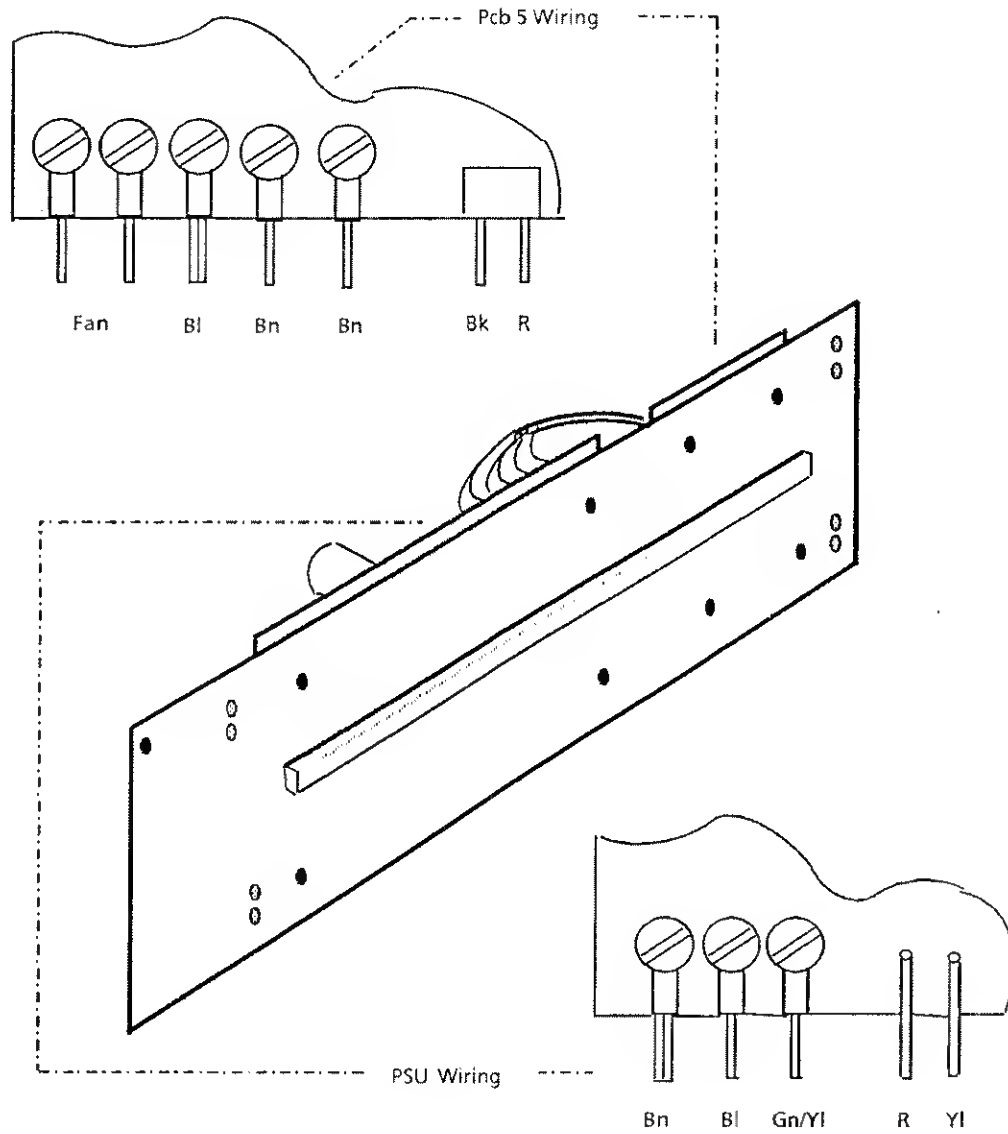


Fig 7.8 Component Wiring

#### 4.6 POWER SUPPLY REMOVAL

The power supply is mounted on the left-hand side panel of the instrument.

To remove the power supply:

1. Remove both halves of the cover, as described in Sections 1 and 4.
2. Remove the four screws labelled 'J' in Fig 7.7.
3. Disconnect the supply leads and lift the power supply module clear.

The mains wiring details are shown in Fig 7.8. There are also six output leads from the "FASTON" terminals to the motherboard. These six connections are clearly identified, both at source and destination. Note that there is no connection to the -5V terminal.

#### 4.7 THE MOTHERBOARD

To remove the motherboard:

1. Remove both halves of the cover, as described in Sections 3.1 and 3.2.
2. Detach the front panel assembly, as described in Section 3.3.
3. Disconnect the fly-leads from the "FASTON" terminals on the motherboard.
4. Turn the unit upside-down and remove the twenty-two fixing screws, plus two more which secure the lower cover front screw mounting plate.
5. Remove the motherboard from the instrument.

# Chapter 8

## Parts Lists & Component Location Diagrams

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8.10	PCB 30	8.71
8.11	PCB 31	8.73

## 1 INTRODUCTION

This chapter contains parts lists for each of the 1255/60 printed circuit boards. The pcbs are listed in numerical order and pcb components, in alphabetical order. When ordering spare parts, it is essential to quote the instrument serial number located on the rear panel, as well as the full description of the item given in the appropriate parts list. Abbreviations used in the parts lists are given in the table below.

### COMPONENT PARTS LIST ABBREVIATIONS

#### CIRCUIT REFERENCES

AE	Aerial
B	Battery
C	Capacitor ( $\mu\text{F}$ )
CSR	Controlled Silicon Rectifier (thyristor)
CV	Capacitor, Variable ( $\mu\text{F}$ )
D	Diode
FS	Fuse
HS	Heatsink
IC	Integrated Circuit
JP	Jumper
L	Inductor
LK	Link
ME	Meter
MSP	Mains Selector Panel

PL	PLug
R	Resistor ( $\Omega$ )
RE	Recording Instrument
RL	Relay
RNL	Resistor, Non-linear ( $\Omega$ )
RP	Resistor Pack ( $\Omega$ )
RV	Resistor, Variable ( $\Omega$ )
S	Switch
SK	Socket
T	Transformer
TP	Test Point (or Terminal Post)
TR	Transistor
V	Valve
ZD	Zener Diode

#### COMPONENT TYPES

##### Fixed Resistors

CACP	Carbon Composition
CAFM	Carbon Film
CKCA	Cracked Carbon
MEFM	Metal Film
MEGL	Metal Glaze
MEOX	Metal Oxide
PF	Precision Fixed
POWW	Power, Wirewound
PRWW	Precision, Wirewound
TEMP	Temperature Sensitive
TKFM	Thick Film
TNFM	Thin Film
VOLT	Voltage Sensitive

##### Variable Resistors

CAFM	Carbon, Front Panel, Multiturn
CAFS	Carbon, Front Panel, Single Turn
CAPM	Carbon, Preset, Multiturn
CAPS	Carbon, Preset, Single Turn
CMFM	Cermet, Front Panel, Multiturn
CMFS	Cermet, Front Panel, Single Turn
CMPM	Cermet, Preset, Multiturn
CMPS	Cermet, Preset, Single Turn
WWFM	Wirewound, Front Panel, Multiturn
WWFS	Wirewound, Front Panel, Single Turn
WWPM	Wirewound, Preset, Multiturn
WWPS	Wirewound, Preset, Single Turn

##### Capacitors

AIR	Air
ALME	Aluminium Electrolytic
ALMS	Aluminium Solid
CARB	Polycarbonate
CERM	Ceramic
ESTF	Polyester Foil
ESTM	Polyester, Metallised
GLAS	Glass
MICA	Mica

MLAC	Metallised Lacquer
PAPF	Paper Foil
PAPM	Paper Metallised
PTFE	Polytetrafluoroethylene
PYLN	Polypropylene Film
STYR	Polystyrene
TAND	Tantalum, Dry
TANF	Tantalum Foil
TANW	Tantalum, Wet

**PCB 2**

Ref.		General Description			Schlumberger Inst. Part No.
C101	CERM	22p	500V	20%	241312200
C102	CERM	22p	500V	20%	241312200
C104	TAND	10	20V	20%	265871000
C105 to C113	CERM	10n	25V	+50% -25%	241941000
C114	ESTM	100n	100V	10%	225451000
C201 to C205	CERM	10n	25V	+50% -20%	241941000
C206	CERM	47n	12V	+50% -25%	241744700
C401	ESTM	220n	100V	10%	225452200
C402	ESTM	220n	100V	10%	225452200
C403	TAND	15	20V	20%	265871500
C404	TAND	15	20V	20%	265871500
C405	ALME	33	63V		208600266
C406	CERM	47n	25V	+50% -25%	241944700
C407	ALME	33	63V		208600266
D101	SD3				300522160
D102	SD3				300522160
D103	LED 1.6V				300750080
D401	SD3				300522160
D402	SD3				300522160
D403	BAY72				300524530
D406	BAY72				300524530
D407	BZY88-C11 11V Zener 5% 1/4W				300523910
D408	SD3				300522160
D409	IN4004				300522070
D410	BY206				300525070
D411	BY206				300525070
F401	750mA				360190180
IC101	MC6801L1-1				510005210
IC103	74LS373				510004870
IC104	74LS245				510004560

**PCB 2 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>					<b>Schlumberger Inst. Part No.</b>
IC107	74LS125					510004630
IC108	74LS04					510002690
IC114	74LS125					510004630
IC115	74LS244					510004500
IC116	74LS138					510003530
IC201 to IC211	UCN4810A					510005180
IC 212	74LS123					510002950
IC213	74LS00					510002000
IC401	74LS74					510002600
PLA	64-way					352364010
PLB	64-way					352364010
R101	MEFM	22k	1/4 W	1%		195342200
R102	MEFM	39	1/4 W	1%		195313900
R103	MEFM	1k8	1/4 W	1%		195331800
R112	MEFM	22k	1/4 W	1%		195342200
R113	MEFM	180k	1/4 W	1%		195351800
R115	MEFM	560	1/4 W	1%		195325600
R201 to R211	MEFM	1k8	1/4 W	1%		195331800
R212	MEFM	56k	1/4 W	1%		195345600
R213 to R223	MEFM	10	1/4W	1%		195311000
R401	MEFM	10k	1/2 W	1%		195441000
R402	MEFM	120	1/4 W	1%		195321200
R403	MEFM	120	1/4 W	1%		195321200
R404	MEFM	2k2	1/4 W	1%		195332200
R405	MEFM	2k2	1/4 W	1%		195332200
R406	MEFM	47	1/2 W	1%		195414700
R407	MEFM	47	1/2 W	1%		195414700
R408	MEFM	1k2	1/4 W	1%		195331200
R409	MEFM	180	1/4 W	1%		195321800
RN101	Res. Network	1k				160400599
RN102	Res. Network	1k				160400599
T401						309617501
TP1						355400760

**PCB 2 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>		<b>Schlumberger Inst. Part No.</b>
TR401	BD155	NPN	300555160
TR402	BD155	NPN	300555160
TR403	BC107	NPN	300554420
TR404	BC107	NPN	300554420
TR405	2N2218A	NPN	300552000
V201	DC40026B2		300730440
X101	4.5MHz		300810430

## PCB 10

Cct Ref.	General Description					Schlumberger Inst. Part No.
C106	CERM	47n	25V	-25 + 50%		241944700
C113	CERM	47n	25V	-25 + 50%		241944700
C114	CERM	47n	25V	-25 + 50%		241944700
C201	CERM	47n	25V	-25 + 50%		241944700
C202	CERM	47n	25V	-25 + 50%		241944700
C203	CERM	47n	25V	-25 + 50%		241944700
C204	CERM	47n	25V	-25 + 50%		241944700
C205	TAND	10u	20V	20%		265871000
C301 to C313	CERM	100n	50V	-20% + 80%		208450140
C319	ALME	22u	40V			273772200
C321	ALME	22u	40V			273772200
C321 to C333	CERM	100n	50V	-20% + 80%		208450140
C334	TAND	10u	25V	20%		208700108
C335	TAND	10u	25V	20%		208700108
C401 to C404	CERM	47n	25V	-25 + 50%		241944700
C409 to C420	CERM	47n	25V	-25 + 50%		241944700
C421	ESTM	150n	100V	10%		225451500
C422	ESTM	150n	100V	10%		225451500
C423	CERM	4p7	500V	20%		241304700
C424	CERM	4p7	500V	20%		241304700
C425	STYR	2n2	125V	2.5%		210132200
C426	STYR	330p	125V	1.0%		210023300
C427	CERM	47n	25V	-25 + 50%		241944700
C430	CERM	15p	500V	20%		241311500
C431	CERM	1n0	500V	-20 + 40%		241331000
1C101	74LS245					510004560
1C103	74LS08					510002910
1C106						519612101
1C113	74LS367					510003030
1C114	TC5516AP					510005470
1C118	74LS00					510002000
1C119	74LS04					510002690

## PCB 10 (Contd.)

Cct Ref.	General Description	Schlumberger Inst. Part No.
IC201	74LS374	510004390
IC202	74LS373	510004870
IC203	74LS139	510002960
IC204	74LS125	510004630
IC205	74LS08	510002910
IC207	74LS109	510005510
IC208	LM339	510090490
IC209	LN2003A	510004980
IC301	79L15	510090430
IC302	78L15	510090420
IC303	79L15	510090430
IC304	78L15	510090420
IC305	79L15	510090430
IC306	78L15	510090420
IC307	79L15A	510090430
IC308	78L15A	510090420
IC309	79L15A	510090430
IC310	78L15A	510090420
IC311	7905	510092020
IC312	78L15	510090420
IC313	79L15	510090430
IC401	MH1218	559700301
IC402	OP-15F	510091150
IC403	MH1218	559700301
IC404	OP-15F	510091150
IC406	CA3039	510000320
IC407	OP-15F	510091150
IC408	OP-15F	510091150
IC409	MC10116P	510004330
IC410	OP221	510092070
IC411	OP15FJ	510091150
IC501	CA3046	300554090
IC502	CA3046	300554090
IC503	74LS02	510002230
IC504	74LS123	510002950
IC603	OP16FJ	510091370
IC604	LM339	510090490
IC605	OP17FJ	510091160
IC606	LM339	510090490
IC701	LM1458	510090400
IC702	LM1458	510090400

PCB 10 (Contd.)

Cct Ref.		General Description				Schlumberger Inst. Part No.
IC703	LM1458					510090400
IC704	LF356					510090440
IC707	CA3039					510000320
IC708	LM339					510090490
IC709	CA3045					300554090
IC710	74LS86					510002880
IC711	74S74					510002020
IC712	74LS04					510002690
L303		100uH				305020380
L304		100uH				305020380
L801		680uH				305020390
L802		680uH				305020390
PL101						352364010
PL102						352364010
PL401						352304070
R101	MEFM	2k2	1/4W	1%		105332200
R102	MEFM	2k2	1/4W	1%		195332200
R104	MEFM	2k2	1/4W	1%		195332200
R105	MEFM	1k	1/4W	1%		195331000
R106	MEFM	1k	1/4W	1%		195331000
R107	MEFM	1k	1/4W	1%		195331000
R202		15k				160400568
R301	MEFM	560	1/4W	1%		195325600
R401	MEFM	330	0.125	0.5%		192723302
R402	MEFM	180	1/4W	1%		195321800
R403	MEFM	180	1/4W	1%		195321800
R404	MEFM	1k3	1/4W	1%		195331300
R405	MEFM	3k3	1/4W	1%		195333300
R406	MEFM	3k3	1/4W	1%		195333300
R412		1k				160400679
R413	MEFM	100	0.125	0.5%		192721002
R414	MEFM	3k		0.02%		160400700
R417	MEFM	2k		0.02%		160400699
R421	MEFM	390		0.01%		160400713
R424	MEFM	1M	0.125	0.5%		192761002
R425	MEFM	10k	1/4W	1%		195341000
R426	MEFM	10k	1/4W	1%		195341000
R427	MEFM	1M	0.125	0.5%		192761002
R428	MEFM	10k	1/4W	1%		195341000
R429	MEFM	10k	1/4W	1%		195341000
R430	MEFM	100k	1/4W	1%		195351000
R431	PRWW	900	0.2W	0.01%		160300445

## PCB 10 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
R432	PRWW	1k	0.2W	0.01%	160300435
R433	MEFM	1k	1/4W	1%	195331000
R434	MEFM	1k	1/4W	1%	195331000
R435	MEFM	1k5		0.02%	160400698
R436	MEFM	150	1/4W	1%	195321500
R437	MEFM	3k9	1/4W	1%	195333900
R438	MEFM	47	1/4W	1%	195314700
R439	MEFM	47	1/4W	1%	195314700
R440	MEFM	1k	1/4W	1%	195331000
R441	MEMF	150	1/4W	1%	195321500
R451	MEFM	10k	1/4W	1%	195341000
R452	MEFM	10k	1/4W	1%	195341000
R453	MEFM	10k	1/4W	1%	195341000
R460	MEFM	47	1/4W	1%	195314700
R461	MEFM	47	1/4W	1%	195314700
R462	MEFM	100	1/4W	1%	195321000
R463	MEFM	100	1/4W	1%	195321000
R480	MEMF	150	1/4W	1%	195321500
R481	MEMF	150	1/4W	1%	195321500
R491	MEFM	270		0.01%	160400712
R492	MEFM	270		0.01%	160400712
R493	MEFM	2k2	1/4W	1%	195332200
R494	MEFM	2k2	1/4W	1%	195332200
R495	MEFM	2k2	1/4W	1%	195332200
R496	MEFM	2k2	1/4W	1%	195332200
R497	MEFM	1k	1/4W	1%	195331000
R498	MEFM	1k	1/4W	1%	195331000
R499	MEFM	100	1/4W	1%	195321000
R501	MEFM	2k2	1/4W	1%	195332200
R502	MEFM	390	1/4W	1%	195323900
R503	MEFM	3k9	1/4W	1%	195333900
R504	MEFM	390	1/4W	1%	195323900
R505	MEFM	12k	1/4W	1%	195341200
R506	MEFM	100	1/4W	1%	195321000
R507	MEFM	100	1/4W	1%	195321000
R508	MEFM	27	1/4W	1%	195312700
R509	MEFM	390	1/4W	1%	195323900
R510	MEFM	82k	1/4W	1%	195348200
R511	MEFM	82k	1/4W	1%	195348200
R512	MEFM	470	1/4W	1%	195324700
R513	MEFM	470	1/4W	1%	195324700
R514	MEFM	100	1/4W	1%	195321000

PCB 10 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
R515	MEFM	470	1/4W	1%	195324700
R516	MEFM	100	1/4W	1%	195321000
R517	MEFM	47k	1/4W	1%	195344700
R518	MEFM	1k	1/4W	1%	195331000
R519	MEFM	100	1/4W	1%	195321000
R520	MEFM	100	1/4W	1%	195321000
R521	MEFM	27	1/4W	1%	195312700
R522	MEFM	100	1/4W	1%	195321000
R523	MEFM	4k7	1/4W	1%	195334700
R524	MEFM	390	1/4W	1%	195323900
R525	MEFM	82k	1/4W	1%	195348200
R526	MEFM	2k2	1/4W	1%	195332200
R527	MEFM	1k	1/4W	1%	195331000
R528	MEFM	1k	1/4W	1%	195331000
R529	MEFM	3k3	1/4W	1%	195333300
R530	MEFM	1k	1/4W	1%	195331000
R601	MEFM	100	1/4W	1%	195321000
R614	TKFM	9k	0.2W	0.1%	160400582
R617	MEFM	18k	1/4W	1%	195341800
R618	MEFM	180k	1/4W	1%	195351800
R619	MEFM	20k	1/4W	1%	195342000
R620	TKFM	9k	0.2W	0.1%	160400582
R623	MEFM	18k	1/4W	1%	195341800
R624	MEFM	180k	1/4W	1%	195351800
R625	MEFM	27k	1/4W	1%	195342700
R626	MEFM	3k9	1/4W	1%	195333900
R627	MEFM	1k5	1/4W	1%	195331500
R631	MEFM	1k		0.02%	160400697
R632	MEFM	2k		0.02%	160400699
R633	MEFM	18k	1/4W	1%	195341800
R634	MEFM	56k	1/4W	1%	195345600
R639	MEFM	20k	1/4W	1%	195342000
R640	MEFM	100k	1/4W	0.1%	198151004
R641	MEFM	900	1/4W	0.1%	198129004
R701	MEFM	56	0.125W	0.5%	192715602
R702	MEFM	100	0.125W	0.5%	195321000
R703	MEFM	180	0.125W	0.5%	192721802
R704	MEFM	6k8	0.125W	0.5%	192736804
R705	MEFM	3k9	0.125W	0.5%	192733904
R706	MEFM	348	0.125W	0.5%	192723481
R707	MEFM	1k1	1/4W	0.5%	198231101
R708	MEFM	1k1	1/4W	0.5%	198231101

## PCB 10 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
R709	MEFM	2k7	1/4W	0.5%	192732701
R710	MEFM	270k	1/4W	0.5%	192752701
R712	MEFM	1k5		0.02%	160400698
R713	MEFM	3k0		0.02%	160400700
R717	MEFM	620		0.02%	160400696
R718	MEFM	18	0.125W	0.5%	192711802
R722	MEFM	1k1	1/4W	0.5%	198231101
R723	MEFM	1k2	0.125W	0.5%	192731202
R724	MEFM	100	1/4W	1%	195321000
R725	MEFM	10k	1/4W	1%	195339100
R726	MEFM	9k1	1/4W	1%	195339100
R727	MEFM	1k	1/4W	1%	195331000
R728	MEFM	15k	1/4W	1%	195341500
R729	MEFM	2k2	1/4W	1%	195332200
R730	MEFM	220	1/4W	1%	195322200
R731	MEFM	330	1/4W	1%	195323300
R732	MEFM	120	1/4W	1%	195321200
R733	MEFM	390	1/4W	1%	195323900
R734	MEFM	33	1/4W	1%	195313300
R735	MEFM	33	1/4W	1%	195313300
R736	MEFM	100	1/4W	1%	195321000
R737	MEFM	15k	1/4W	1%	195341500
R738	MEFM	15k	1/4W	1%	195341500
R739	MEFM	2k7	1/4W	1%	192732701
R740	MEFM	8k2	1/4W	1%	195338200
R741	MEFM	8k2	1/4W	1%	195338200
R742	MEFM	2k2	1/4W	1%	195332200
R743	MEFM	2k2	1/4W	1%	195332200
R744	MEFM	3k9	1/4W	1%	195333900
R745	MEFM	1k5	1/4W	1%	195331500
R746	MEFM	27k	1/4W	1%	195342700
R747	MEFM	270	1.4W	1%	195322700
R748	MEFM	27k	1/4W	1%	195342700
R749	MEFM	270	1.4W	1%	195322700
R750	MEFM	8k2	1/4W	1%	195338200
R751	MEFM	8k2	1/4W	1%	195338200
R752	MEFM	27k	1/4W	1%	195342700
R760	MEFM	1k8	1/4W	1%	195331800
RL401	REED 1-Pole CR2204	0.5A	200VDC		300652520
RL402	RRED 1-Pole CR2204	0.5A	200VDC		300652520
RL403	REED 1-Pole CR2911	0.25A	200VDC		300652510
RL404	RRED 1-Pole CR2911	0.25A	200VDC		300652510

**PCB 10 (Contd)**

Cct Ref.	General Description				Schlumberger Inst. Part No.
RL601	Reed 1-Pole	CR2204	0.5A	200VDC	300652520
RV401	CMPM	50	1/2W	20%	130915000
RV402	CMPM	50	1/2W	20%	130915000
RV403	CMPM	100	1/2W	10%	130651000
RV701	CMPM	100	1/2W	10%	130651000
SK106	Skt.		24-Way	DIL	300584740
SK114	Skt.		24-Way	DIL	300584740
SK401	Skt.		1-Way	Fixed	352101530
SK402	Skt.		1-Way	Fixed	352101530
TP402 to TP404 TP501	Terminal Test Hook				355400760
TP502 TP601 to TP603	Terminal Test Hook				355400760
TP701	Terminal Test Hook				355400760
TR401	WN1098	N-Chan. J-FET			300556480
TR402	2N5912	Dual N-Chan. J-FET			300556510
TR403	WN1098	N-Chan. J-FET			300556480
TR404	2N5912	Dual N-Chan. J-FET		300556510	
TR405	2N5912	Dual N-Chan. J-FET		300556510	
TR406	P1087	P-Chan. J-FET			300555550
TR407 to TR410	BFY90				300553890
TR411	2N5912	Dual N-Chan. J-FET			300556510
TR412	ZVN1310	Morepower N-Chan.FET			300556180
TR413	ZVN1310	Morepower N-Chan.FET			300556180
TR501	BCY70	PNP Silicon			300553590
TR502	BCY70	PNP Silicon			300553590
TR601 to TR604	U1899	N-Chan. J-FET			300554320
TR633	U1899	N-Chan. J-FET			300554320
TR634	U1899	N-Chan. J-FET			300554320
TR701	U1897	N-Chan. J-FET			300553800
TR704	P1087	P-Chan. J-FET			300555550
TR705	P1087	P-Chan. J-FET			300555550

**PCB 10 (Contd)**

<b>Cct Ref.</b>		<b>General Description</b>	<b>Schlumberger Inst. Part No.</b>
TR709 to TR712	BCY70	PNP Silicon	300553590
TR713	U1899E	N-Chan. J-FET	300554320
TR714	BCY70	PNP Silicon	300553590
TR715	BC107	NPN Silicon	300553320
TR716	BC107	NPN Silicon	300553320
TR717	BCY70	PNP Silicon	300553590
TR718	P1087	P-Chan. J-FET	300555550
TR719	U1899E	N-Chan. J-FET	300554320
TR720	BCY70	PNP Silicon	300553590

PCB 14

Cet Ref.		General Description			Schlumberger Inst. Part No.
C101 to C108 C109	CERM	1n	500V	-20% + 40%	241331000
	TAND	10	20V	20%	265871000
C110	CERM	1n	500V	-20% + 40%	241331000
C201	ALME	33	63V		208600266
C202	ALME	33	63V		208600266
C203	CERM	47n	25V	+ 25% + 50%	241944700
C207	ALME	33	63V		208600266
C211	CERM	1n	50V	-20% + 40%	241331000
C215	CERM	1n	50V	-20% + 40%	241331000
C223	CERM	1n	50V	-20% + 40%	241331000
C234	CERM	100p	50V	20%	241321000
C237	TAND	10	25V	20%	208700100
C250	ESTM	1	63V	10%	225161000
C297	ALME	100p	25V		241321000
C298	ALME	100p	25V		241321000
C301	CERM	100n	50V	-20% + 50%	208450140
C302	CERM	10n	25V	-20% + 50%	241941000
C304	CERM	100n	50V	-20% + 50%	208450140
C310	CERM	47n	25V	-25% + 50%	241944700
C311	ALME	33	63V		208600266
C398	CERM	47n	50V	-20% + 40%	241944700
C399	CERM	47n	50V	-20% + 40%	241944700
C401	ESTM	4u7	63V	20%	225164700
C403	CERM	47n	50V	-20% + 40%	241944700
C404		15n			222341500
C405	CERM	47n	50V	-20% + 50%	241944700
C406	CERM	47n	50V	-20% + 50%	241944700
C407	ALME	100p	25V		241321000
C408	TAND	1u0	35V	20%	266061000
C409	TAND	1u0	35V	20%	266061000
C410	CERM	1u0	35V	-20% + 40%	241331000
C411	CERM	10p	500V	20%	241311000
C412	CERM	1n0	500V	-20% + 40%	241331000
C414	CERM	1n0	500V	-20% + 40%	241331000
C416	CERM	10n	50V	-20% + 50%	241941000
C501		47	100V		208600320
C502		47	100V		208600320
C503	CERM	100n	100V	20%	208450133

## PCB 14 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
C504	CERM	100n	100V	20%	208450133
C505	CERM	100n	100V	20%	208450133
C506	ALME	100p	25V		241321000
C507	ESTM	680n	63V	10%	225156800
C508	CERM	1n0	500C	-20% + 40%	241331000
C509	CERM	1n0	500C	-20% + 40%	241331000
C510	CERM	47n	50V	-20% + 40%	241944700
C511	CERM	47n	50V	-20% + 40%	241944700
C512	CERM	3n3	500V	-20% + 40%	241333300
C513	CERM	1n0	500V	-20% + 40%	241331000
C514	CERM	3n3	500V	-20% + 40%	241333300
C515	CERM	1n0	500V	-20% + 40%	241331000
C518	ALME	100p	25V		241321000
C519	CERM	100n	100V	20%	208450140
C520	CERM	470p	500V	20%	241324700
C601	ESTM	220n	100V	10%	225452200
C602	ESTM	220n	100V	10%	225452200
C603	TAND	10	25V	10%	208700108
C604	CERM	47n	50V	-20% + 40%	241944700
C605	CERM	100n	100V	20%	208450140
C606	CERM	100n	100V	20%	208450140
C607	ALME	220	25V		208600265
C608	ALME	220	25V		208600265
C609	CERM	100n	100V	20%	208450133
C610	CERM	100n	100V	20%	208450133
C611		47	100V		208600320
C612		47	100V		208600320
C613	ESTM	330n	100V	10%	225453300
C614	CERM	100n	100V	20%	208450140
C615	ESTM	330n	100V	10%	225453300
C616	CERM	100n	100V	20%	208450140
C617	ESTM	330n	100V	10%	225453300
C618	ALME	22	40V		273772200
C619	CERM	100n	100V	20%	208450140
C620	ALME	22	40V		273772200
C621	CERM	47n	50V	-20% + 40%	241944700
C622	ALME	220	25W		208600265
C623	ALME	100p	25V		241321000
C701	ESTM	1	100V	10%	225461000
C702	CERM	10n	50V	-20% + 50%	241941000
C703	ESTM	220n	100V	10%	225452200
C704	CERM	1n0	500V	-20% + 40%	241331000

PCB 14 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
C705	CERM	47n	50V	-20% + 40%	241944700
C706	TAND	4 $\mu$ 7	35V	20%	208700109
C707	TAND	1	35V	20%	266061000
C708	ALME	33	63V		208600266
C709	ESTM	150n	100V	10%	225451500
C710	CERM	100n	100V	20%	208450140
C711	ESTM	1	100V	10%	225461000
C712	CERM	1n	500V	-20% + 40%	241331000
C713	CERM	1n	500V	-20% + 40%	241331000
C714	CERM	100n	100V	20%	208450140
C715	ESTM	1	100V	10%	225461000
C716	ESTM	1	100V	10%	225461000
C717	CERM	1n	500V	-20% + 40%	241331000
C718	CERM	1n	500V	-20% + 40%	241331000
C719	CERM	10n	50V	-20% + 50%	241941000
C720	CERM	10n	50V	-20% + 50%	241941000
C721	CERM	47p	500V	20%	241314700
C722	CERM	100n	100V	10%	208450140
CV301		8- 40p			290020370
D301	J511		50V	4.7mA	300526040
D302	BAV10		60V	0.6 A	300526360
D308	BAV10		60V	0.6 A	300526360
D314	J511		50V	4.7mA	300526040
D501	BZY88-C30		30V	5% 0.4W	300526040
D502	BZY88-C30		30V	5% 0.4W	300526040
D503	16Z0 Zen.		16V	5%0.4W	300521320
D504 to D508	SD3		75V	0.075A	300522160
D601	SD3		75V	0.075A	300522160
D602	SD3		75V	0.075A	300522160
D603 to D608	BAY72				300524530
D609 to D616	BY206		250V	0.5A	300525070
D701	9Z1		9.1V	5% 0.4W	300521340
D702	9Z1		9.1V	5% 0.4W	300521340
D703			18V	5% 0.4W	300521300

## PCB 14 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
D704	SD3	75V	0.075A		300522160
D705	SD3	75V	0.075A		300522160
EJ501	Ejector				420000600
EJ502	Ejector				420000600
FS601		2 Amp.			360190220
HL509	Heatlink				300584670
HL510	Heatlink				300584670
IC101	LS273				510004380
IC102	LS373				510004870
IC103	LS139				510002960
IC104	S03				510003290
IC105	LS74				510002600
IC106	LS00				510002000
IC107	LM339				510090490
IC108	ULN2003				510004980
IC109	LM339				510090490
IC201	REF-02				510090940
IC202	OP-05CP				510091130
IC203	OP-05CP				510091130
IC204	OP-05CP				510091130
IC205	OP-27GZ				510091510
IC206	OP-27GZ				510091510
IC302	OP-05CP				510091130
IC303	OP-05CP				510091130
IC304	TIL117				300540240
IC401	LF356				510090440
IC402	HA2539				510091530
IC501	TIL117				300540240
IC502	TIL117				300540240
IC601	LS74				510002600
IC602	LM78L 15AC				510090420
IC603	LM78L 15AC				510090420
IC604	7815C No INS kit necessary				510090320
IC605	7915C INS kit is needed				510090330
IC701	CA3046				300554090
IC702	LF356				510090440
IC703	HA2540				510091920
IC704	HA2540				510091920

## PCB 14 (Contd.)

Cct Ref.	General Description					Schlumberger Inst. Part No.
L401	FX4019					309010400
L402	FX4019					309010400
L403	Toroid SE1 Type MM622/T2					309010480
L601 to L605		56uH				305020360
L701 to L704	FX4019					309020400
PCB14	PC Card					12609514X
PL101		64-way				352364010
PL102		64-way				352364010
R101	MEFM	4k7	1/4W	1% 0.25		195334700
R102	MEFM	22k	1/4W	1% 0.25		195342200
R103	MEFM	10k	1/4W	1% 0.25		195341000
R104	MEFM	15k	1/4W	1% 0.25		160400568
R107	MEFM	1k0	1/4W	1% 0.25		195331000
R108	MEFM	4k7	1/4W	1% 0.25		195334700
R109	MEFM	4k7	1/4W	1% 0.25		195334700
R111	MEFM	4k7	1/4W	1% 0.25		195334700
R201	MEFM	1k	0.125W	0.1%		192931000
R202	MEFM	10k	0.125W	1%		192941000
R203	MEFM	526R3	0.125W	0.1%		160400682
R204	PR	8k	0.2W	0.05%		160300522
R205	PR	5k	0.2W	0.05%		160300521
R206	MEFM	100k	0.25W	1%		195351000
R207	PR	8k	0.2W	0.05%		160300522
R208	PR	5k	0.2W	0.05%		160300521
R209	PR	2k5	0.2W	0.05%		160300520
R236	MEFM	10k	1/4W	1%		195341000
R238	MEFM	10k	1/4W	1%		195341000
R240	PR	1k6	0.2W	0.05%		160300519
R243	PR	592R6	0.2W	0.05%		160300517
R245	PR	1k6	0.2W	0.05%		160300519
R246	PR	26R66	0.2W	0.05%		160300523
R250	MEFM	1k441	0.125W	0.1%		160400681
R293	MEFM	100	1/4W	1%		195321000
R294	MEFM	270	1/4W	1%		195322700
R295	MEFM	47	1/4W	1%		195314700
R297	MEFM	47	1/4W	1%		195314700

## PCB 14 (Contd.)

Cct Ref.	General Description					Schlumberger Inst. Part No.
R301	MEFM	100k	1.4W	1%		195351000
R302	MEFM	100k	1.4W	1%		195351000
R303	MEFM	5k6	1/4W	1%		195335600
R304	MEFM	15k	1/4W	1%		195341500
R305	MEFM	2k7	1/4W	1%		195332700
R310	MEFM	56	1/4W	1%		195315600
R317	MEFM	2k7	1/4W	1%		195332700
R320	MEFM	47	1/4W	1%		195314700
R324	PR	1.0560k	0.2W	0.05%		160300518
R325	PR	1.0560k	0.2W	0.05%		160300518
R326	MEFM	330	1/4W	1%		195323300
R327	MEFM	1650k	1/4W	1%		160400715
R332	MEFM	12k	0.125W	0.1%		195341200
R333	MEFM	12k	0.125W	0.1%		195341200
R334	MEFM	220	1/4W	1%		195322200
R335	MEFM	220	1/4W	1%		195322200
R336	MEFM	4k7	1/4W	1%		195334700
R337	MEFM	5k6	1/4W	1%		195335600
R395	MEFM	1k0	1/4W	1%		192731001
R396	MEFM	1650k	0.125W	0.1%		160400715
R397	MEFM	15k	1/4W	0.25%		195341500
R398	MEFM	18k	1/4W	0.25%		192741801
R399	MEFM	18k	1/4W	0.25%		192741801
R401	MEFM	47	1/4W	1%		195314700
R402	MEFM	47	1/4W	1%		195314700
R404	MEFM	9k95	0.125W	0.1%		192939950
R405	MEFM	10k	0.125W	0.1%		192941000
R406	MEFM	1k	0.125W	0.1%		192931000
R407	MEFM	15k	1/4W	1%		195341500
R408	MEFM	1M	1/4W	1%		192761002
R409	MEFM	1k	0.125	0.1%		192931000
R410	MEFM	910	1/4W	1%		195329100
R411	MEFM	330k	1/4W	1%		195353300
R412	MEFM	100	1/4W	1%		195321000
R413	MEFM	10	1/4W	1%		195311000
R414	MEFM	1k0	1/4W	1%		195331000
R415	MEFM	10	1/4W	1%		195311000
R416	MEFM	100	1/4W	1%		195321000
R501	MEFM	10k	1/4W	1%		195341000

PCB 14 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
R502	MEFM	150	1/4W	1%	195321500
R503	MEFM	1k0	1/4W	1%	195331000
R504	MEFM	47k	1/4W	1%	195344700
R505	MEFM	1k5	1/4W	1%	195331500
R506	MEFM	100	1/4W	1%	195321000
R507	MEFM	33	1/4W	1%	195313300
R508	MEFM	120	1/4W	1%	195321200
R509	MEFM	820	1/4W	1%	195328200
R510	MEFM	270	1/4W	1%	195322700
R511	MEFM	270	1/4W	1%	195322700
R512	MEFM	820	1/4W	1%	195328200
R513	MEFM	820	1/4W	1%	195328200
R514	MEFM	47	1/4W	1%	195314700
R515	MEFM	820	1/4W	1%	195328200
R517	MEFM	22	1/4W	1%	195312200
R518	MEFM	47	1/4W	1%	195314700
R519	MEFM	22	1/4W	1%	195312200
R521	MEFM	680	1/4W	1%	195326800
R522	MEFM	10	1/4W	1%	195311000
R524	MEFM	100	1/4W	1%	195321000
R525	MEFM	680	1/4W	1%	195326800
R526	MEFM	10	1/4W	1%	195311000
R527	MEFM	47	1/4W	1%	195314700
R528	MEFM	47	1/4W	1%	195314700
R529	MEFM	43	1/4W	1%	192704302
R530	MEFM	5R6	1/4W	1%	172305600
R531	MEFM	5R6	1/4W	1%	172305600
R532	MEFM	5R6	1/4W	1%	172305600
R533	MEFM	5R6	1/4W	1%	172305600
R534	MEFM	4R3	1/4W	1%	192704302
R535	MEFM	100	1/4W	1%	195321000
R536	MEFM	100	1/4W	1%	195321000
R537	MEFM	22k	1/4W	1%	195342200
R538	MEFM	22k	1/4W	1%	195342200
R540	MEFM	50	0.125W	0.1%	198515001
R541	MEFM	47k	1/4W	1%	195344700
R542	MEFM	47k	1/4W	1%	195344700
R543	MEFM	120k	1/4W	1%	195351200
R601	MEFM	120	1/4W	1%	195321200
R602	MEFM	120	1/4W	1%	195321200

## PCB 14 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No
R603	MEFM	2k2	1/4W	1%	195332200
R604	MEFM	2k2	1/4W	1%	195332200
R605	MEFM	47	1/4W	1%	195314700
R606	MEFM	47	1/4W	1%	195314700
R607	MEFM	1k5	1/4W	1%	195331500
R608	MEFM	1R0	1/4W	1%	175001000
R609	MEFM	10k	1/4W	1%	195341000
R610	MEFM	120	1/4W	1%	195321200
R701	MEFM	5k6	1/4W	1%	195335600
R702	MEFM	330	0.125W	0.1%	192923300
R703	MEFM	4k7	1/4W	1%	195334700
R704	MEFM	390	1/4W	1%	192723902
R705	MEFM	100k	1/4W	1%	195351000
R706	MEFM	4k7	1/4W	1%	195334700
R707	MEFM	390	1/4W	1%	192723902
R708	MEFM	100k	1/4W	1%	195351000
R709	MEFM	100k	1/4W	1%	195351000
R710	MEFM	330	1/4W	1%	195323300
R711	MEFM	10	1/4W	1%	195311000
R712	MEFM	10	1/4W	1%	195311000
R713	MEFM	910	1/4W	1%	195329100
R714	MEFM	100	1/4W	1%	195321000
R715	MEFM	8k2	1/4W	1%	195338200
R716	MEFM	100	1/4W	1%	195321000
R717	MEFM	10	1/4W	1%	195311000
R718	MEFM	1k0	1/4W	1%	195331000
R719	MEFM	10	1/4W	1%	195311000
R720	CADDOCK	900 + 90 + 10			160400683
R723	MEFM	91	1/4W	1%	195319100
R724	MEFM	82	1/4W	1%	195318200
R725	MEFM	1k	1/4W	1%	195331000
R726	MEFM	4k7	1/4W	1%	195334700
R727	MEFM	660	1/4W	1%	192926600
R728	MEFM	1k0	1/4W	1%	195331000
RL201	MEFM	RS12			300652190
RL301	MEFM	RS12			300652190
RL402	MEFM	RS12			300652190
RL501	MEFM	NF2-12V			300652170
RL701	MEFM	RS12			300652190
RL702	MEFM	RS12			300652190

**PCB 14 (Contd.)**

<b>Cet Ref.</b>	<b>General Description</b>		<b>Schlumberger Inst. Part No</b>
RV301	MEFM	2k	130632000
RV302	MEFM	2k	130632000
RV501	MEFM	500	130625000
RV601	MEFM	10k MI 1051	130941000
RV701	MEFM	20k MI 1058	130642000
SHIM	Mica Shim MI 1029		300585350
SK201			352304070
SK501	SMB		352101530
SK701	1-Way R/Angle SMB		352101530
T601			309620302B
TP601			355400760
TP602			355400760
TP603			355400760
TP604			355400760
TR201	U1899J-FET		300554320
TR202	U1899J-FET		300554320
TR203	U1899J-FET		300554320
TR210	2N3993 J-FET		300556470
TR211	2N3993 J-FET		300556470
TR302	BFY90 NPN		300553890
TR305	BFY90 NPN		300553890
TR306	U430 MI 1019 J-FET		300556520
TR307	U441		300555910
TR308	2N2218A NPN		300552000
TR309	2N2904A MI 1133 PNP		300551670
TR501	BF257		300554120
TR503	Trans. PNP 25V 0.3A		300555620
TR504	Trans. Pwr. NPN 100V 3A		300555760
TR506	2N4959 PNP		300556260
TR507	BFY90 NPN		300553890
TR508	TIP31C NPN		300555760
TR509	2N3866 NPN		300556270
TR510	2N5160 PNP		300555140
TR511	TIP32C PNP		300555620
TR512	BCY70	PNP	300553590
TR513	BC183	NPN	300555590
TR514	BC183	NPN	300555590
TR515	BC183	NPN	300555590
TR601	BC183	NPN	300555590
TR602	BC183	NPN	300555590

**PCB 14 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>	<b>Schlumberger Inst. Part No.</b>
TR603	BDX35 NPN Includes kit	300555230
TR604	BDX35 NPN	300555230
TR701	2N5432 J-FET	300556390
TR702	U1899 J-Fet	300554320
TR703	BC183 NPN	300555590

# PCB 15

Cct Ref.	General Description				Schlumberger Inst. Part No.
C1	TAND	10	20V	20%	265071000
C2	CERM	47n	25V	-25 + 50%	241944700
C3	CERM	47n	25V	-25 + 50%	241944700
C4	CERM	47n	25V	-25 + 50%	241944700
C100	CERM	47n	25V	-25 + 50%	241944700
C102 to C109	CERM	47n	25V	-25 + 50%	241944700
C201	CERM	10n	25V	-25 + 50%	241941000
C202	CERM	10n	25V	-25 + 50%	241941000
C203	TAND	10	25V	20%	208700108
C204	TAND	10	25V	20%	208700108
C205	ESTM	470n	63V	20%	225254700
C206	ESTM	100n	100V	20%	225551000
C207	ESTM	100n	100V	20%	225551000
C208	ESTM	100n	100V	20%	225551000
C209 to C212	CERM	10n	25V	-25 + 50%	241941000
C213	CERM	2n2	500V	-20 + 40%	241332200
C214	CERM	10n	25V	-25 + 50%	241941000
C215	CERM	10n	25V	-25 + 50%	241941000
C216	CERM	15p	500V	20%	241311500
C217 to C220	CERM	10n	25V	-25 + 50%	241941000
C221	ESTM	330n	63V	10%	225153300
C222	ESTM	330n	63V	10%	225153300
C223	ESTM	100n	100V	20%	225551000
C224	ESTM	100n	100V	20%	225551000
C225	CERM	47p	500V	20%	241314700
C226	CERM	220p	500V	80%	241322200
C227	CERM	220p	500V	80%	241322200
C301	ESTM	. 22	100V	10%	225452200
C302	ESTM	. 22	100V	10%	225452200
C303	TAND	10	25V	20%	208700108
C304	CERM	47n	25V	-25 + 50%	241944700
C305	CERM	0.1	40V	-25 + 50%	242051000
C306	CERM	0.1	40V	-25 + 50%	242051000
C307	ALME	220	25V		208600265
C308	ALME	220	25V		208600265
C309	ALME	220	25V		208600265

## PCB 15 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
C310	CERM	0.1	40V	-25 + 50%	242051000
C311	ALME	220	25V		208600265
C312	CERM	0.1	40V	-25 + 50%	242051000
C313	ALME	220	25V		208600265
C314		100p			241321000
C401	ESTM	22	100V	10%	225452200
C402	ESTM	22	100V	10%	225452200
C403	TAND	10	25V	20%	208700108
C404	CERM	47n	25V	-25 + 50%	241944700
C405	CERM	0.1	40V	-25 + 50%	242051000
C406	CERM	0.1	40V	-25 + 50%	242051000
C407	ALME	220	25V		208600265
C408	ALME	220	25V		208600265
C409	ALME	220	25V		208600265
C410	CERM	100p	50V	20%	241321000
CV200		0.5 - 7p			290060110
D201	HP5082622		15V	0.02%	300525380
D202	BZY88 C6V		600V	1.5V	300521240
D203	HP5082622		15V	0.02%	300525380
D301	SD3		75V	0.075%	300522160
D302	SD3		75V	0.075%	300522160
D303 to D308	BAY72				300524530
D309 to D316	BY206		250V	0.5A	300525070
D401	SD3		75V	0.075%	300522160
D402	SD3		75V	0.075%	300522160
D403 to D408	BAY72				300524530
D409 to D412	BY206				300525070
F301	750mA				360190180
F401	750mA				360190180
IC1	74LS139				510002960

**PCB 15 (Contd.)**

Cct Ref.	General Description	Schlumberger Inst. Part No.
IC2 to IC6	74LS273	510004380
IC7	74LS08	510002910
IC8	74LS74	510002600
IC9	74S03	510003290
IC10	74LS273	510004380
IC11	74LS00	510002000
IC100	74LS157	510002240
IC101	74LS283	510004220
IC102	74LS175	510003170
IC103	74LS669	510004850
IC104	74LS85	510002930
IC105	74LS85	510002930
IC106	82S181	510005410
IC107	74LS244	510004500
IC108	82S123	510005440
IC109	82S123	510005440
IC110	74LS374	510004390
IC111	74LS374	510004390
IC112	74LS163	510004170
IC113	74LS273	510004380
IC114	74LS10	510002870
IC115	74LS86	510002880
IC116	74LS04	510002690
IC117	74LS11	510003110
IC118	74LS86	510002880
IC201	DAC 08EP	510091030
IC202	LF357	510091330
IC203	AD7533LN	510090670
IC204	LF357	510091330
IC205	LM339N	510090490
IC206	REF02CP	510090940
IC207	LF356N	510091320
IC208	AD7541KN	510090680
IC209	OP07	510091420
IC210	MC78L15A	510090420
IC211	MC78L15A	510090430
IC301	74LS74	510002500
IC401	74LS74	510002500

## PCB 15 (Contd.)

Cct Ref.	General Description					Schlumberger Inst. Part No.
L301 to L305	56 $\mu$ H	10%				305020360
L401 to L403	56 $\mu$ H	10%				305020360
L401		56u				305020360
L302		56u				305020360
L303		56u				305020360
PLA		64-Way				352364010
PLB		64-Way				352364010
R1	MEFM	1k	1/4W	1%		195331000
R2	MEFM	4k7	1/4W	1%		195334700
R3	MEFM	1k	1/4W	1%		195331000
R4	MEFM	4k7	1/4W	1%		195334700
R5	MEFM	4k7	1/4W	1%		195334700
R100	MEFM	1k	1/4W	1%		195331000
R201	MEFM	12k	1/4W	1%		195341200
R202	MEFM	1M	1/4W	1%		198361001
R203	MEFM	18k	1/4W	1%		198341804
R204	MEFM	750	1/4W	1%		198127501
R205	MEFM	910	1/4W	1%		198129101
R206	MEFM	6k8	1/4W	1%		195336800
R207	MEFM	6k8	1/4W	1%		195336800
R208	MEFM	3k6	1/4W	1%		198133604
R209	MEFM	100	1/4W	1%		195321000
R210	MEFM	1k8	1/4W	1%		195331800
R211	MEFM	1k8	1/4W	1%		195331800
R212	MEFM	470	1/4W	1%		195324700
R213	MEFM	1k2	1/4W	1%		195331200
R214	MEFM	470	1/4W	1%		195324700
R215	MEFM	1k2	1/4W	1%		195331200
R216	MEFM	4k7	1/4W	1%		195334700
R217	MEFM	3k6	1/4W	1%		198133604
R218	MEFM	3k6	1/4W	1%		198133604
R219	MEFM	1k8	1/4W	1%		195331800
R220	MEFM	47k	1/4W	1%		195344700
R221	MEFM	47k	1/4W	1%		195344700
R222	MEFM	2k4	1/4W	1%		198132401
R223	MEFM	220	1/4W	1%		195322200
R224	MEFM	1k2	1/4W	1%		195331200

**PCB 15 (Contd.)**

<b>Cet Ref.</b>	<b>General Description</b>				<b>Schlumberger Inst. Part No.</b>
R225	MEFM	47	1/4W	1%	198114701
R226	MEFM	3k9	1/4W	1%	195333900
R227	MEFM	1k2	1/4W	1%	195331200
R228	MEFM	100	1/4W	1%	195321000
R229	MEFM	5k	1/4W	1%	192935001
R301	MEFM	120	1/4W	1%	195321200
R302	MEFM	120	1/4W	1%	195321200
R303	MEFM	2k2	1/4W	1%	195332200
R304	MEFM	2k2	1/4W	1%	195332200
R305	MEFM	47	1/4W	1%	198114701
R306	MEFM	47	1/4W	1%	198114701
R307	MEFM	1k5	1/4W	1%	195331500
R308	MEFM	1	1/4W	1%	175001000
R309	MEFM	1	1/4W	1%	175001000
R310	MEFM	120	1/4W	1%	195321200
R311	MEFM	10k	1/4W	1%	195341000
R401	MEFM	120	1/4W	1%	195321200
R402	MEFM	120	1/4W	1%	195321200
R403	MEFM	2k2	1/4W	1%	195332200
R404	MEFM	2k2	1/4W	1%	195332200
R405	MEFM	47	1/4W	1%	198114701
R406	MEFM	47	1/4W	1%	198114701
R407	MEFM	1k5	1/4W	1%	195331500
R408	MEFM	120	1/4W	1%	195321200
R408	MEFM	1	1/4W	1%	175001000
R409	MEFM	10k	1/4W	1%	195341000
RV202	MEFM	10k			195341000
RV203	MEFM	200			110016520
RV301		10k			130941000
RV401		10k			130941000
SK201					352304070
SK202					352302060
SK203					352302060
SK301					300584900
SK401					352304070
SKT1					352302060
T301					309616901
T401					309616901
TP1					355400760
TP2					355400760
TP3					355400760

**PCB 15 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>					<b>Schlumberger Inst. Part No.</b>
TP4						355400760
TP5						355400760
TP6						355400760
TP7						355400760
TP8						355400760
TP9						355400760
TP10						355400760
TP11						355400760
TR201	PNP	BCY70	40V	0.2A		300553590
TR202	PNP	BCY70	40V	0.2A		300553590
TR203	J-FET	E421	25V			300555910
TR204	J-FET	E421	25V			300555910
TR205	J-FET	U1899	40V			300554320
TR206	J-FET	U1899	40V			300554320
TR301	NPN	BC107	45V	0.3A		300554420
TR302	NPN	BC107	45V	0.3A		300554420
TR303	NPN	BDX35	60V	5A		300555230
TR401	NPN	BC107	45V	0.3A		300554420
TR402	NPN	BC107	45V	0.3A		300554420
TR403	NPN	BDX35	60V	5A		300555230
TR404	NPN	BDX35	60V	5A		300555230

PCB 16

Cct Ref.		General Description			Schlumberger Inst. Part No.
C101	TAND	22	16V	20%	208700106
C102	CERM	10n	50V	-20% + 50%	241941000
C103	CERM	47n	50V	-20% + 40%	241944700
C104	TAND	22	16V	20%	208700106
C105	MICA	22p	350V	5%	250312200
C106	MICA	39p	350V	5%	250313900
C107	MICA	39p	350V	5%	250313900
C108	MICA	22p	350V	5%	250312200
C109	CERM	10n	25V	-20% + 50%	241941000
C110	CERM	1n	500V	-10% + 40%	250331000
C111	CERM	47n	50V	-20% + 50%	241944700
C112	CERM	47n	50V	-20% + 50%	241944700
C113	CERM	47n	50V	-20% -50%	241944700
C114	TAND	22	16V	20%	208700106
C115 to C118	CERM	10n	50V	-20% + 50%	241941000
C119	MICA	15p	350V	5%	250311500
C120	MICA	47p	350V	5%	250314700
C121	MICA	47p	350V	5%	250314700
C122	MICA	33p	350V	5%	250313300
C123	CERM	10n	50V	-20% + 50%	241941000
C124	CERM	10n	50V	-20% + 50%	241941000
C125	CERM	47n	50V	-20% + 50%	241944700
C126	CERM	10n	50V	-20% + 50%	241941000
C127 to C130	CERM	47n	50V	-20% + 50%	241944700
C131	CERM	10	50V	-20% + 50%	208700108
C132	CERM	47n	50V	-20% + 5%	241944700
C133	CERM	47n	50V	-20% + 50%	241944700
C134	ESTM	1	100V	10%	225461000
C135 to C144	CERM	47n	50V	-20% + 50%	241944700
C203	CERM	1n	50V	-20% + 40%	241331000
C204	CERM	47n	50V	-20% + 50%	241944700
C210	MICA	15p	350V	5%	250311500
C211	TAND	10	25V	20%	208700108
C212	CERM	47n	50V	-20% + 50%	241944700
C213	TAND	22n	16V	20%	208700106

## PCB 16 (Contd.)

Cct Ref.	General Description				Schlumberger Inst. Part No.
C215	CERM	47n	50V	-20% + 50%	241944700
C216	CERM	47n	50V	-20% + 50%	241944700
C220	CERM	47n	50V	-20% + 50%	241944700
C222	ESTM	1	100V	10%	225461000
C224	CERM	47n	50V	-20% + 50%	241944700
C225	CERM	47n	50V	-20% + 50%	241944700
C226	CERM	10n	50V	-20% + 50%	241941000
C227	CERM	10n	50V	-20% + 50%	241941000
C228	CERM	10n	50V	-20% + 50%	241941000
C229	MICA	33p	350V	5%	241313300
C230	CERM	47n	50V	-20% + 50%	241944700
C232	CERM	10n	50V	-20% + 50%	241941000
C233	CERM	1n	50V	-20% + 50%	241331000
C234	CERM	10n	50V	-20% + 50%	241941000
C236	CERM	47n	50V	-20% + 50%	241944700
C237	CERM	10n	50V	-20% + 50%	241941000
C239	CERM	47n	50V	-20% + 50%	241944700
C240	CERM	47n	50V	-20% + 50%	241944700
C241	CERM	10n	50V	-20% + 50%	241941000
C242	CERM	10n	50V	-20% + 50%	241941000
C243	ESTM	220n	100V	10%	225452200
C247	CERM	47n	50V	-20% + 50%	241944700
C301	CERM	47n	50V	-20% + 50%	241944700
C302	CERM	47n	50V	-20% + 50%	241944700
C303	TAND	10	25V	20%	208700108
C304	CERM	47n	50V	-20% + 50%	241944700
C305	TAND	10	25V	20%	208700108
C306	CERM	47n	50V	-20% + 50%	241944700
C307	CERM	47n	50V	-20% + 50%	241944700
C308	PLYN	2n2	63V	5%	208100208
C309	CERM	47n	50V	-20% + 50%	241944700
C310	CERM	47n	50V	-20% + 50%	241944700
C311	CERM	47n	50V	-20% + 50%	241944700
C312	CERM	150p	500V	20%	241321500
C313	CERM	47n	50V	-20% + 50%	241944700
C314	CERM	47n	50V	-20% + 50%	241944700
C315	TAND	33	20V	20%	265873300
C316	CERM	150p	50V	-20% + 50%	241321500
C317	CERM	47n	50V	-20% + 50%	241944700
C318	CERM	47n	50V	-20% + 50%	241944700
C401	CERM	47n	50V	-20% + 50%	241944700
C402	CERM	47n	50V	-20% + 50%	241944700

**PCB 16 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>				<b>Schlumberger Inst. Part No.</b>
C403	CERM	10n	50V	-20% + 50%	241941000
C404	MICA	18p	350V	5%	250311800
C405	MICA	39p	350V	5%	250313900
C406	MICA	39p	350V	5%	250313900
C407	MICA	18p	350V	5%	250311800
C408	CERM	10n	50V	-20% + 50%	241941000
C409	CERM	47n	50V	-20% + 50%	241944700
C410	CERM	10n	50V	-20% + 50%	241941000
C411	CERM	10n	50V	-20% + 50%	241941000
C412	CERM	1n	50V	-20% + 50%	241331000
C413	CERM	10n	50V	-20% + 50%	241941000
C414	CERM	10n	50V	-20% + 50%	241941000
C415	TAND	10	25V	20%	208700108
C416	CERM	47n	50V	-20% + 50%	241944700
C417	CERM	10n	50V	-20% + 50%	241941000
C418	MICA	33p	350V	5%	241313300
C419	CERM	10n	50V	-20% + 50%	241941000
C420	CERM	47n	50V	-20% + 50%	241944700
C420	MICA	15p	350V	5%	250311500
CV401		2-27p			290030280
D101	MV209				300526390
D102	SD3		75V	0.075V	300522160
D103	HP2900		10V	0.2A	300524870
D104	HP2900		10V	0.2A	300524870
D105 to D109	SD3		75V	0.075A	300522160
D110	WR057				300525770
D111	WR057				300525770
D201	MV209				300526390
D202	SD3		75V	0.075A	300522160
D203	SD3		75V	0.075A	300522160
D204	SD3		75V	0.075A	300522160
D205	WR057				300525770
D206	SD3		75V	0.075A	300522160
D207	SD3		75V	0.075A	300522160
D208	WR057				300525770
D301	SD3		75V	0.075A	300522160
D302	SD3		75V	0.075A	300522160
IC101		MC10116			510004330

**PCB 16 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>	<b>Schlumberger Inst. Part No.</b>
IC102	MC1648	510007550
IC103	MC12002	510092040
IC104	HA2540	510091920
IC105	MC4044	510002270
IC106	74LS390	510004410
IC107	74LS390	510004410
IC108	HA2540	510091920
IC109A	784LS03	510004140
IC110	78L05A	510091050
IC111a	LF412C	510091910
IC112A	74LS03	510004140
IC113C	74LS14	510003120
IC201	MC10116	510004330
IC202A	74LS03	510004140
IC203	78L05A	510091050
IC205	MC12002	510092040
IC206a	LF412C	510091910
IC207	LM311	510091280
IC208	MC4044	510002270
IC301A	74LS368	510003040
IC302	74LS374	510004390
IC303A	74LS02	510002230
IC304a	LM339	510090490
IC305	LM361	510092050
IC306A	74LS123	510002950
IC3907	7815	510090320
IC308	7915	510090330
IC309	74LS157	510002240
IC310	74LS390	510004410
IC401	MC12002	510092040
IC402	MC10116	510004330
IC403	MC10107	510002250
IC404	79L05	510090950
IC405	MC10116	510004330
L101	270nH	305020840
L102	10μH	305020480
L103 to L107	270nH	305020840
L108	FX1242	309010010
L109	1μH	305020470

**PCB 16 (Contd.)**

Cct Ref.		General Description			Schlumberger Inst. Part No.
L110		1 $\mu$ 2H			305020800
L111		1 $\mu$ 2H			305020800
L112 to L119		FX1242			309010010
L201		FX1242			309010010
L202		FX1242			309010010
L203		470nH			305020620
L208		10 $\mu$ H			305020480
L209		FX1242			309010010
L401		FX1242			309010010
L402		1 $\mu$ 8H			305020430
L403		1 $\mu$ 8H			305020430
L404		1 $\mu$ 8H			305020430
L405		FX1242			309010010
L406		470nH			305020620
LV101		180nH			305030490
PLA		64-Way Connector			352364010
PLB		64-Way Connector			352364010
PLD		AMP 2-Way			352302060
PLE		AMP 2-Way			352302060
PLF		AMP 2-Way			352302060
PLG		SMB			352101530
PLH		AMP 2-Way			352302060
R101	MEFM	82	1/4W	1%	195318200
R102	MEFM	62	1/4W	1%	195316200
R103	MEFM	82	1/4W	1%	195318200
R104	MEFM	39	1/4W	1%	195313900
R105	MEFM	62	1/4W	1%	195316200
R106	MEFM	390	1/4W	1%	195323900
R107	MEFM	180	1/4W	1%	195321800
R108	MEFM	180	1/4W	1%	195321800
R109	MEFM	390	1/4W	1%	195323900
R110	MEFM	100	1/4W	1%	195321000
R111	MEFM	2k2	1/4W	1%	195332200
R112	MEFM	15k	1/4W	1%	195341500
R113	MEFM	22k	1/4W	1%	195342200
R114	MEFM	220	1/4W	1%	195322200
R115	MEFM	1k8	1/4W	1%	195331800
R116	MEFM	2k2	1/4W	1%	195332200

## PCB 16 (Contd.)

Cct Ref.		General Description				Schlumberger Inst. Part No.
R117	MEFM	100	1/4W	1%		195321000
R118	MEFM	4k7	1/4W	1%		195334700
R119	MEFM	470	1/4W	1%		195324700
R120	MEFM	4k7	1/4W	1%		195334700
R121	MEFM	1k2	1/4W	1%		195331200
R122	MEFM	10k	1/4W	1%		195341000
R123	MEFM	2k2	1/4W	1%		195332200
R124	MEFM	82k	1/4W	1%		195348200
R125	MEFM	8k2	1/4W	1%		195338200
R126	MEFM	470	1/4W	1%		195324700
R127	MEFM	22k	1/4W	1%		195342200
R128	MEFM	470	1/4W	1%		195324700
R129	MEFM	18k	1/4W	1%		195341800
R130	CACP	1M	1/4W	10%		172061000
R131	MEFM	39k	1/4W	1%		195343900
R132	MEFM	820	1/4W	1%		195328200
R133	MEFM	11k	0.125W	1%		192741102
R134	MEFM	820	1/4W	1%		195328200
R135	CACP	1M	1/4W	10%		172061000
R136	MEFM	22k	1/4W	1%		195342200
R137	MEFM	47	1/4W	1%		195314700
R138	MEFM	47	1/4W	1%		195314700
R139	MEFM	1k	1/4W	1%		195331000
R140	MEFM	470	1/4W	1%		195324700
R141	MEFM	19k	1/4W	1%		195341000
R142	MEFM	220	1/4W	1%		195322200
R143	MEFM	4k7	1/4W	1%		195334700
R144	MEFM	68	1/4W	1%		195334700
R201	MEFM	4k7	1/4W	1%		195334700
R202	MEFM	68	1/4W	1%		195416800
R203	MEFM	390	1/4W	1%		195323900
R204	MEFM	100	1/4W	1%		195321000
R205	MEFM	470	1/4W	1%		195324700
R207	MEFM	4k7	1/4W	1%		195334700
R208	MEFM	2k2	1/4W	1%		195332200
R209	MEFM	470	1/4W	1%		195324700
R210	MEFM	100	1/4W	1%		195321000
R212	MEFM	270k	1/4W	1%		195352700
R213	MEFM	10k	1/4W	1%		195341000
R214	MEFM	51k	1/4W	1%		195345100
R215	MEFM	270	1/4W	1%		195322700

## PCB 16 (Contd.)

Cct Ref.		General Description				Schlumberger Inst. Part No.
R216	MEFM	270	1/4W	1%		195322700
R217	MEFM	33k	1/4W	1%		195343300
R218	MEFM	390	1/4W	1%		195323900
R219	MEFM	4k7	1/4W	1%		195334700
R220	MEFM	4k7	1/4W	1%		195334700
R221	MEFM	4k7	1/4W	1%		195334700
R222	MEFM	100	1/4W	1%		195321000
R223	MEFM	22k	1/4W	1%		195342200
R224	MEFM	6k8	1/4W	1%		195336800
R225	MEFM	2k2	1/4W	1%		195332200
R226	MEFM	100k	1/4W	1%		195351000
R227	MEFM	100	1/4W	1%		195321000
R228	MEFM	22k	1/4W	1%		195342200
R229	MEFM	270	1/4W	1%		195322700
R230	MEFM	33k	1/4W	1%		195343300
R231	MEFM	22k	1/4W	1%		195342200
R232	MEFM	150	1/4W	1%		195321500
R233	MEFM	150	1/4W	1%		195321500
R234	MEFM	39	1/4W	1%		195313900
R301	MEFM	4k7	1/4W	1%		195334700
R302	MEFM	4k7	1/4W	1%		195334700
R303	MEFM	1k	1/4W	1%		195331000
R304	MEFM	100	1/4W	1%		195321000
R305	MEFM	22k	1/4W	1%		195342200
R306	MEFM	2k2	1/4W	1%		195332200
R307	MEFM	2k2	1/4W	1%		195332200
R308	MEFM	4k7	1/4W	1%		195334700
R309	MEFM	22k	1/4W	1%		195342200
R310	MEFM	22k	1/4W	1%		195342200
R401	MEFM	10k	1/4W	1%		195341000
R402	MEFM	270	1/4W	1%		195322700
R403	MEFM	300	1/4W	1%		195323000
R404	MEFM	1k2	1/4W	1%		195331200
R405		8 x 100				192121000
R406	MEFM	300	1/4W	1%		195331200
R407	MEFM	390	1/4W	1%		195323900
R408	MEFM	100	1/4W	1%		195321000
R409	MEFM	4k7	1/4W	1%		195334700
R410	MEFM	4k7	1/4W	1%		195334700
R411		8 x 680				160400659

**PCB 16 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>					<b>Schlumberger Inst. Part No.</b>
R412	MEFM	1k8	1/4W	1%		195331800
R413	MEFM	390	1/4W	1%		195323900
R414	MEFM	100	1/4W	1%		195421000
R415	MEFM	390	1/4W	1%		195323900
R416	MEFM	2k2	1/4W	1%		195332200
R417	MEFM	470	1/4W	1%		195324700

## 7 PCB 17

Cct Ref.		General Description			Schlumberger Inst. Part No.
C1	TAND	10u	20V	20%	266871000
C2	CERM	47n	500V	-20 + 40%	241944700
C3	CERM	47n	500V	-20 + 40%	241944700
C4	CERM	47n	500V	-20 + 40%	241944700
C5	CERM	47n	500V	-20 + 40%	241944700
C6	CERM	47n	500V	-20 + 40%	241944700
C7	CERM	47n	500V	-20 + 40%	241944700
C8	CERM	47n	500V	-20 + 40%	241944700
C9	CERM	47n	500V	-20 + 40%	241944700
C10	CERM	47n	500V	-20 + 40%	241944700
C11	CERM	47n	500V	-20 + 40%	241944700
C101 to C110	CERM	47n	500V	-20 + 40%	241944700
D101	NNV				300750080
IC1	74LS74				510005790
IC2	74LS377				510005790
IC3	74LS169				510004850
IC4	74LS02				510002230
IC5	74LS00				510002000
IC6	74LS157				510002240
IC7	74LS157				510002240
IC8	74LS157				510002240
IC9	74LS163				510004170
IC10	74LS163				510004170
IC11	74LS20				510002700
IC100	75LS125				510004630
IC101	74LS138				510003530
IC102	74LS374				510004390
IC103	74LS374				510004390
IC104	74LS373				510004870
IC105	74LS02				510002230
IC106 to IC111	74LS163				510004170
IC112	74LS74				510005790
IC113	74LS74				510005790
IC114	74LS00				510002000
IC115	74LS04				510002690
IC116	74LS51				510003520
IC117	74LS51				510003520

**PCB 17 (Contd.)**

<b>Cct Ref.</b>		<b>General Description</b>				<b>Schlumberger Inst. Part No.</b>
IC118	74LS32					510003140
IC119	74LS51					510003520
IC120	74LS163					510004170
IC121	74LS374					510004390
IC122	74LS374					510004390
IC123	74LS74					510005790
IC124	74LS109					510005510
IC125	74LS08					510002910
IC127	74LS157					510002240
PLA						352364010
PLB						352364010
R1	MEFM	1K	1/4W	1%		195331000
R101	MEFM	1K	1/4W	1%		195331000
R102	MEFM	390	1/4W	1%		195323900

# PCB 18

Cct. Ref.	General Description				Schlumberger Inst. Part No.
C1	TAND	10	20V	20%	265871000
C2 to C22	CERM	47n	12V	+50% -25%	241944700
C101 to C114	CERM	47n	12V	+50% -25%	241944700
IC1	74LS125				510004630
IC2	74LS245				510004560
IC3	74LS138				510003530
IC4	74LS04				510002690
IC5 to IC11	74LS273				510004380
IC12 to IC15	74LS283				510004220
IC16 to IC19	74LS273				510004380
IC20 to IC22	74LS283				510004220
IC23	16L8				510006200
IC24	74LS109				510005510
IC25	74LS162				510005500
IC26	74LS163				510004170
IC27	74LS163				510004170
IC29	74AS885				510006830
IC30	74LS162				510005500
IC31	74LS162				510005500
IC101	74LS164				510002890
IC102	74LS164				510002890
IC103	74LS163				510004170
IC104	74LS163				510004170

**PCB 18 (Contd.)**

<b>Cct. Ref.</b>	<b>General Description</b>					<b>Schlumberger Inst. Part No.</b>
IC105	74LS04					510002690
IC106	74LS109					510005510
IC107	74LS08					510002910
IC108	74LS164					510002890
IC109	74LS164					510002890
IC110	74LS10					510002870
IC111	74LS11					510003110
IC112	74LS74					510002600
IC113	74S37					510003330
IC114	74LS51					510003520
IC115	74LS163					510004170
IC116	74LS163					510004170
IC117	74LS163					510004170
IC118	74LS51					510003520
IC119	74LS163					510004170
IC120	74LS163					510004170
IC122	74LS377					510005790
IC123	74LS109					510005510
IC124	74LS163					510004170
IC125	74LS163					510004170
IC126	74LS390					510004410
IC127	74LS02					510002230
IC128	74LS163					510004170
IC129	74LS157					510002240
IC130	74LS163					510004170
PLA						352364010
PLB						352364010
R1	MEFM	1k	1%	0.25W		195331000
R101 to R105	MEFM	1k	1%	0.25W		195331000

# PCB 22

Cct. Ref.		General Description				Schlumberger Inst. Part No.
B1	NI-CAD	2.4V	Battery			800400220
C1	TAND	2 $\mu$ 2	20V	20%		265862200
C2	TAND	1	35V	20%		266061000
C3		22p	500V	20%		241312200
C4	CERM	22p	500V	20%		241312200
C5	CERM	10n	25V	-25 + 50%		241941000
C6	TAND	10	20V	20%		265871000
C7 to C33	CERM	10n	25V	-25 + 50%		241941000
C101	TAND	10	20V	20%		265871000
C102 C103 to C106	ESTM	330n	63V	10%		225153300
	CERM	47p	500V	20%		241314700
C107	TAND	10	20V	20%		265871000
C108	ESTM	330n	63V	10%		225153300
CON1	PLUG	4-WAY		FIXED		352304070
D1	IN5818	1A	30V			300525600
D2	SD3	0.075A	75V			300522160
D3	SD3	0.075A	75V			300522160
IC1	MC68B09					510005121
IC2	74LS245					510004560
IC3	74LS245					510004560
IC4	74LS244					510004500
IC5	74LS244					510004500
IC6	MC14584B					510005230
IC7	74LS139					510002960
IC8	74LS138					510003530
IC9	82S123					510005440
IC11	74LS125					510004630
IC12	74LS14					510003120
IC13	MC14584B					510005230

**PCB 22 (Contd.)**

<b>Cct. Ref.</b>	<b>General Description</b>	<b>Schlumberger Inst. Part No.</b>
IC14 to IC18	HM6264LP1	510006500
IC19 to IC21	X2864AP	510006501
IC25	AM27256	510007220
IC26	AM27128	510006271
IC27	AM27128	510006271
IC28	AM27256	510007220
IC29	74LS173	510004180
IC30	74LS173	510004180
IC31	74LS244	510004500
IC32	74LS244	510004500
IC33	74LS244	510004500
IC101	7406	510000760
IC102	74LS173	510004180
IC103 to IC105	74LS138	510003530
IC107 to IC110	SYP 6551P	510006090
IC111	MC 6840	510005020
IC113	8291A	510005590
IC114	74LS244	510004500
IC115	79L05	510000950
IC116	AM26LS30	510004790
IC117	AM26LS32	510004800
IC118	74LS04	510002690
IC119 to IC122	MC3448A	510004800
IC123	74LS126	510005650
IC124	74LS00	510002000
IC125	74LS161	510004160
IC126	74LS244	510004500

**PCB 22 (Contd.)**

Cct. Ref.	General Description					Schlumberger Inst. Part No.
IC127	74LS244					510004500
1C128	78L12					510090450
PLA						352364010
PLC						352364010
R2	MEFM	22k	1/4W	1%		195342200
R3	MEFM	1k	1/4W	1%		195331000
R4	MEFM	100k	1/4W	1%		195351000
R6	MEFM	1k	1/4W	1%		195331000
R7	MEFM	10k	1/4W	1%		195341000
R9	MEFM	100k				195351000
R10	MEFM	1k	1/4W	1%		195331000
R11 to R13	MEFM	1k	1/4W	1%		195331000
R14	MEFM	10k	1/4W	1%		195341000
R15 to R17	MEFM	1k	1/4W	1%		195331000
R18	MEFM	10k	1/4W	1%		195341000
R19	MEFM	10k	1/4W	1%		195341000
R101 to R104	MEFM	390	1/4W	1%		195323900
R107	MEFM	470	1/4W	1%		195324700
R116	MEFM	10k	1/4W	1%		195341000
R118	MEFM	10k	1/4W	1%		195341000
R119	MEFM	10k	1/4W	1%		195341000
R120 to R122	MEFM	1k	1/4W	1%		195331000
RN1	TKFM	8x1k	0.1W	2%		160400599
RN2	TKFM	8x1k	0.1W	2%		160400599
RN101	TKFM	8x1k	0.1W	2%		160400599
RN102	TKFM	8x1k	0.1W	2%		160400599
SW1						375000540
SW2						375000540
X1		6.4MHz				300810550
X101		1.8432M Hz				300810890

**PCB 22 [Contd.]**

<b>Cct. Ref.</b>	<b>General Description</b>	<b>Schlumberger Inst. Part No.</b>
IC14 to IC18	HM6264LP1	510006500
IC19 to IC21	X2864AP	510006501
IC25	AM27256	510007220

## PCB 30

Cct Ref.	General Description				Schlumberger Inst. Part No.
C1	CERM	100p	500V	20%	241321000
C2	CERM	10p	500V	20%	241311000
IC1	74139				510002960
IC2	74LS273				510004380
IC3	74LS273				510004380
IC4	74LS273				510004380
IC5	74LS373				510004870
IC6	74122				510002940
IC7	74191				510004190
IC8	74191				510004190
IC9	74154				510001340
IC10	PAL16R4				510005360
IC11	74122				510002940
IC12	7407				510000750
IC13	74LS04				510002690
IC14	74LS00				510002000
IC15	DG301				510091110
IC16	DG301				510091110
IC17	LM339A				510090490
IC18	7407				510000750
IC19	7407				510000750
IC20	7407				510000750
IC21 to IC25	74LS86				510002880
PLA	64-way Rt./Angle				352364010
PLB	64-way Rt./Angle				352364010
PLD	32-way Rt./Angle				352332080
R1		10k	1/4W	1%	195341000
R2		10k	1/4W	1%	195341000
R3 to R7		33k	1/4W	1%	195333300
R8		2k2	1/4W	1%	195332200
R9 to R12		4k7	1/4W	1%	195334700
R13		10k	1/4W	1%	195341000
R14		4k7	1/4W	1%	195334700
R15		4k7	1/4W	1%	195334700

**PCB 30 (Contd.)**

<b>Cct Ref.</b>	<b>General Description</b>				<b>Schlumberger Inst. Part No.</b>
R16	Res.Network	8x 4k7			160400614
R17	Res.Network	8x 4k7			160400614
R18		4k7	1/4W	1%	195334700
R418	MEFM	470	1/4W	1%	195324700
R419	MEFM	470	1/4W	1%	195324700
R420	MEFM	470	1/4W	1%	195324700
R421	MEFM	4k7	1/4W	1%	195334700
R422	MEFM	3k9	1/4W	1%	195333900
R423	MEFM	100	1/4W	1%	195324700
TG102 to TG401					355900550
TP102					355400760
TP103					355400760
TP201					355400760
TP202					355400760
TP301					355400760
TP302					355400760
TP401					355400760
TR101	U1899E				300554320
TR102	U1899E				300554320
TR201	BC107				300553320
TR401	2N2369				300552390
X201	60MHz				300810980
X401	60MHz				300810980

## PCB 31

Cct Ref.	General Description				Schlumberger Inst. Part No.
C102	TAND	1	35V	20%	266061000
C103	TAND	1	35V	10%	265961000
C106	CERM	10n	25V	-25 + 50%	241941000
C107	CERM	15n	500V	20%	241941000
C108	TAND	1	35V	20%	266061000
C109	TAND	10	6.3V	20%	208700108
C110	CERM	1n	500V	-20 + 40	241331000
C111	TAND	1	35V	10%	265961000
C112	CERM	47n	25V	-25 + 50	241944700
C113	CERM	47n	25V	-25 + 50	241944700
C114	CERM	1p	500V	±0.1	241944700
C117	ALME		63V		208600266
C118	CERM	47n	25V	-25 + 50	241944700
C117	ALME		63V		208600266
C220	CERM	47n	25V	-25 + 50	241944700
C121	CERM	10n	25V	-25 + 50%	241941000
C122	TAND	10	6.3V	20%	208700108
C123	CERM	1n	500V	-20 + 40	241331000
C124	CERM	1n	500V	-20 + 40	241331000
C125	CERM	4p7	100V	±0.5	208450146
C126	CERM	1n	500V	-20 + 40	241331000
C127	CERM	33p	500V	20%	241313300
D101	SD3		75V <sub>piv</sub>	0.075A	300522360
D102	BAV10		60V	0.6A	300522360
D103	BAV10		60V	0.6A	300522360
D105	SD3		75V <sub>piv</sub>	0.075A	300522360
D106	SD3		75V <sub>piv</sub>	0.075A	300522360
IC101	7805	+ VOLTS REG.			510090500
IC102	MH1218	HF AMP.			559700301
IC103	OP27	OP. AMP.			510091510
IC104	7905	-VOLTS REG.			510092020
IC105	7815	+ VOLTS REG.			510090320
IC106	7915	-VOLTS REG.			510090330
R101	MEFM	100	0.25W	1%	195321000
R102	MEFM	10	0.25W	1%	195311000
R103	MEFM	120	0.25W	1%	195321200
R104	MEFM	120	0.25W	1%	195321200

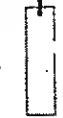
## PCB 31 (Contd)

Cct Ref.		General Description			Schlumberger Inst. Part No.
R105	MEFM	1	0.25W	1%	198301002
R106	MEFM	51	0.5W	1%	195415100
R107	CACP	5R6	0.5W	10%	172305600
R108	MEFM	56	0.25	1%	195315600
R109	MEFM	56	0.25	1%	195315600
R110	FP	5k	2W	0.05%	160300521
R111	CACP	5R6	0.5W	10%	172305600
R112	CACP	5R6	0.5W	10%	172305600
R113		50			195315102
R114	MEFM	560	0.25W	1%	195325600
R115	MEFM	5k6	0.25W	1%	195335600
R116	MEFM	10	0.25W	1%	195311000
R117	CACP	5R6	0.5W	10%	172305600
R118	CACP	5R6	0.5W	10%	172305600
R119	MEFM	10k	0.25	1%	195341000
R120	MEFM	56	0.25	1%	195315600
R121	MEFM	56	0.25	1%	195315600
R123	MEFM	4k7	0.25	1%	195334700
R124	MEFM	560	0.25W	1%	195325600
R125	MEFM	120	0.25W	1%	195321200
R126	MEFM	120	0.25W	1%	195321200
R129	MEFM	33	0.25W	1%	195313300
R130	MEFM	33	0.25W	1%	195313300
R131	MEFM	75	0.25W	1%	195317500
R133	MEFM	5k6	0.25W	1%	195335600
R134	MEFM	12k	0.25W	1%	195341200
R124	MEFM	560	0.25W	1%	195325600
R135	MEFM	47	0.25W	1%	195314700
R136	MEFM	47	0.25W	1%	195314700
R137	MEFM	100	0.25W	1%	195321000
R138	MEFM	220	0.25W	1%	195321000
R139	MEFM	15k	0.5W	1%	195341500
RL101	RS12				300652190
RL102	RS12				300652190
RV101	Multi-turn	100	0.5	10%	130921000
RV102	Multi-turn	2k	0.5	10%	130932000
SK101	SMB				352101530
SK102	SMB				352101510
SK103	4-WAY				352304070
SK104					352302080

**PCB 31 (Contd.)**

<b>Cct Ref.</b>		<b>General Description</b>			<b>Schlumberger Inst. Part No.</b>
TR101	BFY90	NPN	15V	1.3GHz	300553890
TR102	BFR96	NPN	15V	5GHz	300556400
TR103	BFR96	NPN	15V	5GHz	300556400
TR104	BFQ32	PNP	15V	3.6GHz	300556410
TR105	BFQ32	PNP	15V	3.6GHz	300556410
TR106	BFY90	NPN	15V	1.3GHz	300553890
TR107	U309	J-FET	25V	VHF	300556240
TR108	U309	J-FET	25V	VHF	300556240

SKL



0V



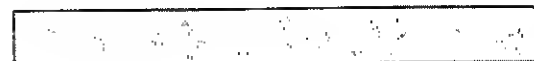
SKB11



SKB10



SKB9



SKB8



SKB6



SKB4



SKB3



SKB2



SKB1



SKA12



SKA11



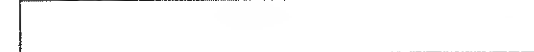
SKA10



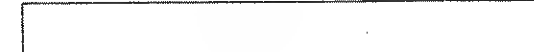
SKA9



SKA8



SKA6



SKA4



SKA3



SKA2



SKA1



SKC



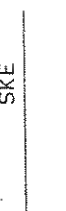
SKD



SKM



SKN



SKO



SKP



SKQ

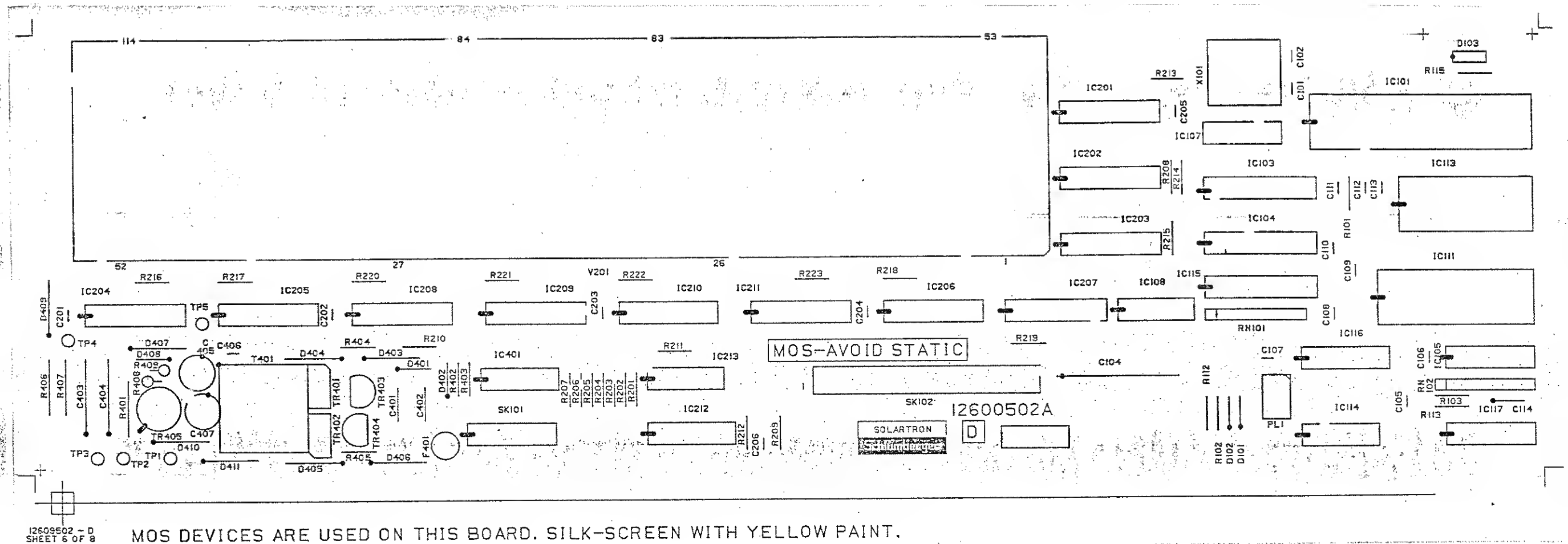


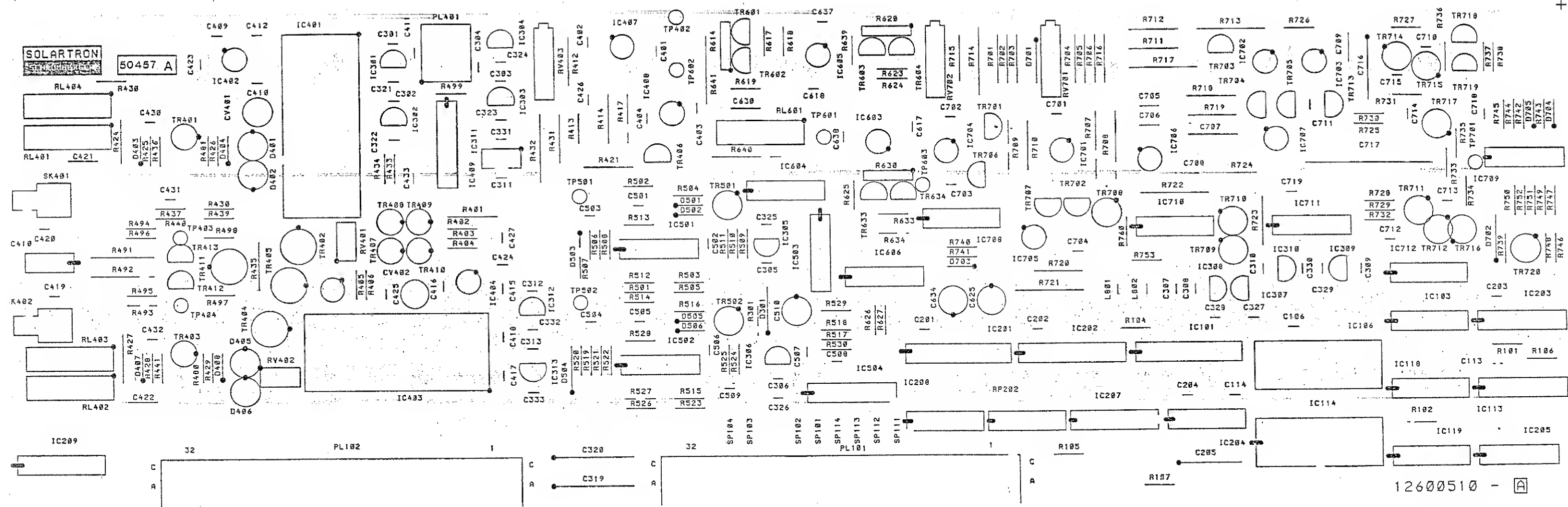
SKR



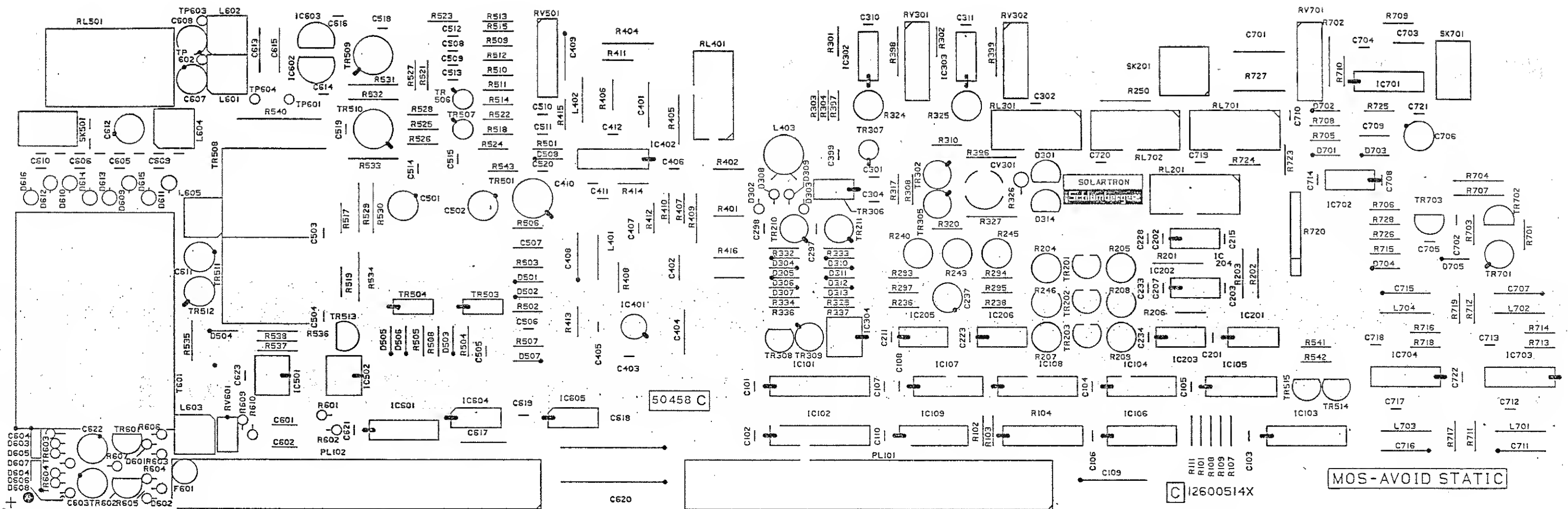
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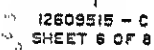
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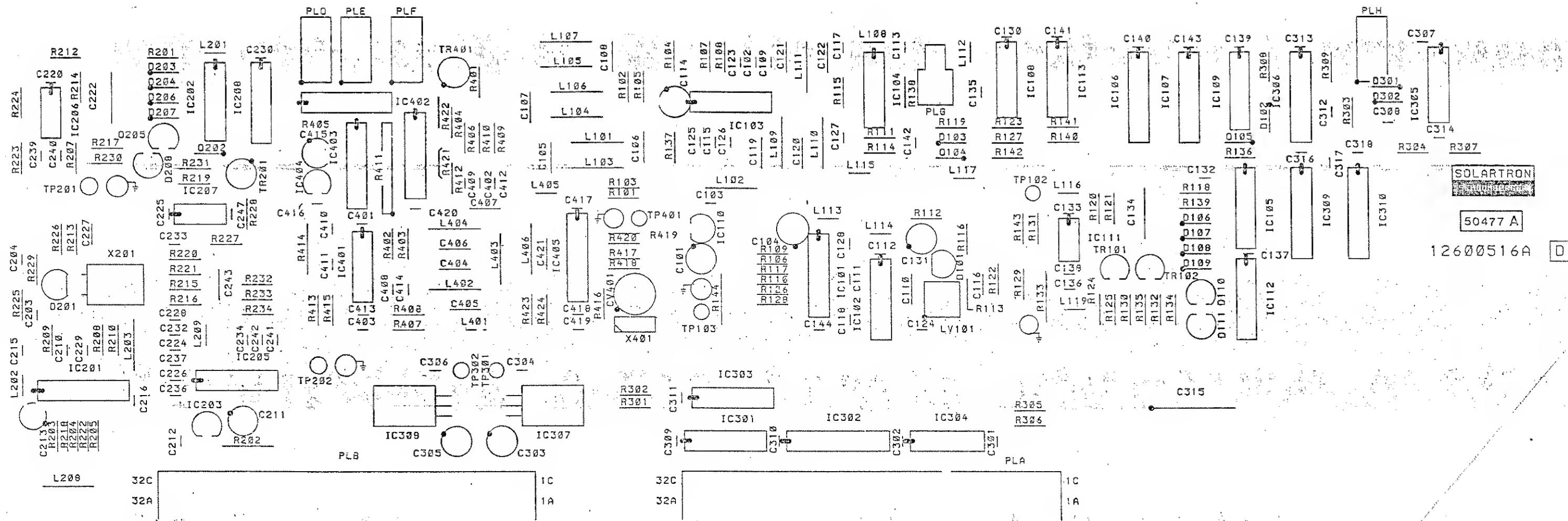


12609510 - A  
 NOTATION  
 SHEET 6 OF 8  
 LAYER 6

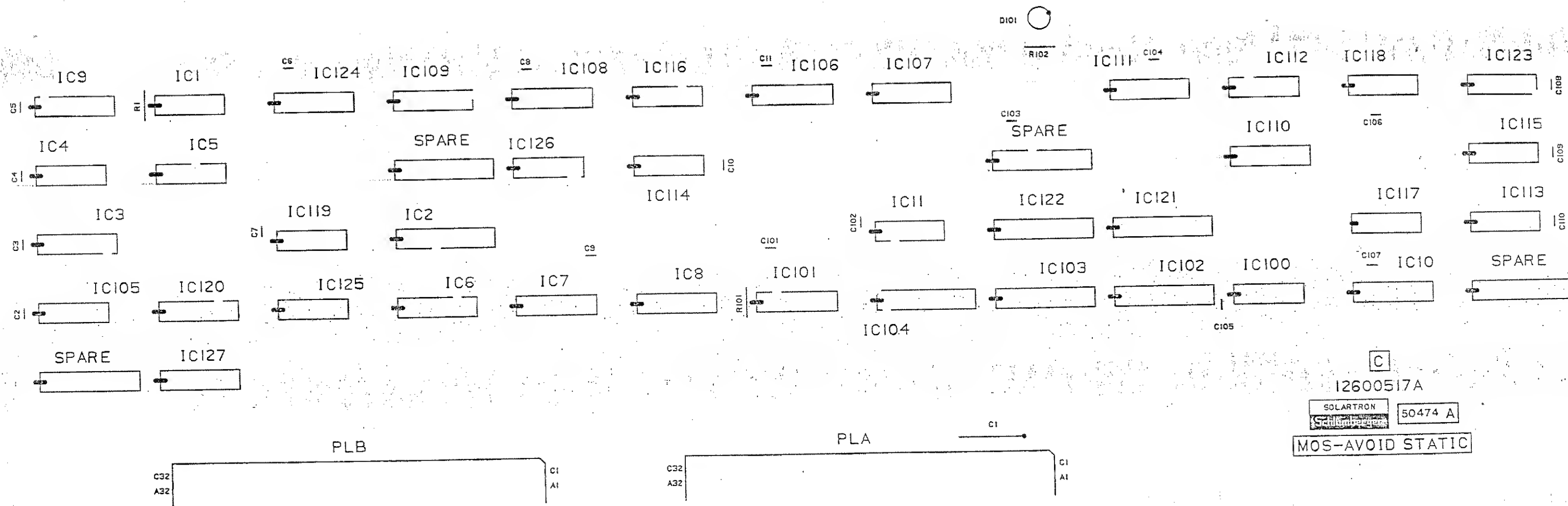




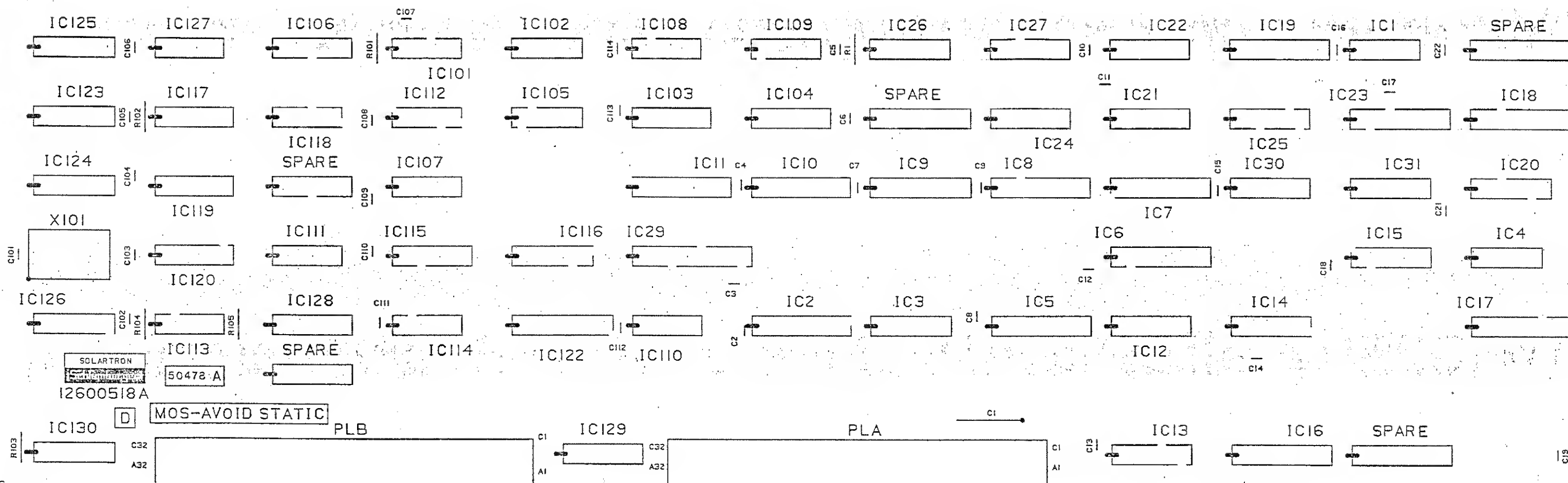
### Diad. 8.5 PCB 15 COMPONENT LAYOUT



12609516-0 NOTATION  
SHEET 6 OF 8



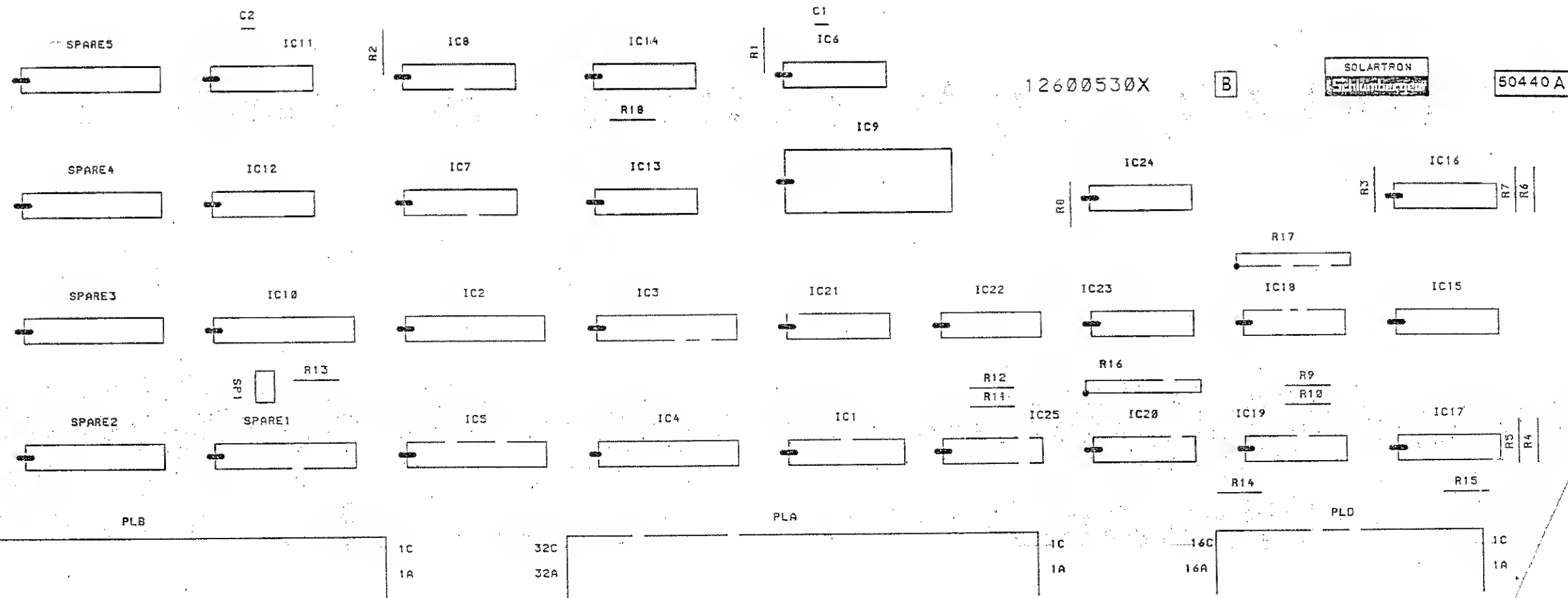
MOS DEVICES ARE USED ON THIS BOARD, SILK SCREEN WITH YELLOW PAINT.



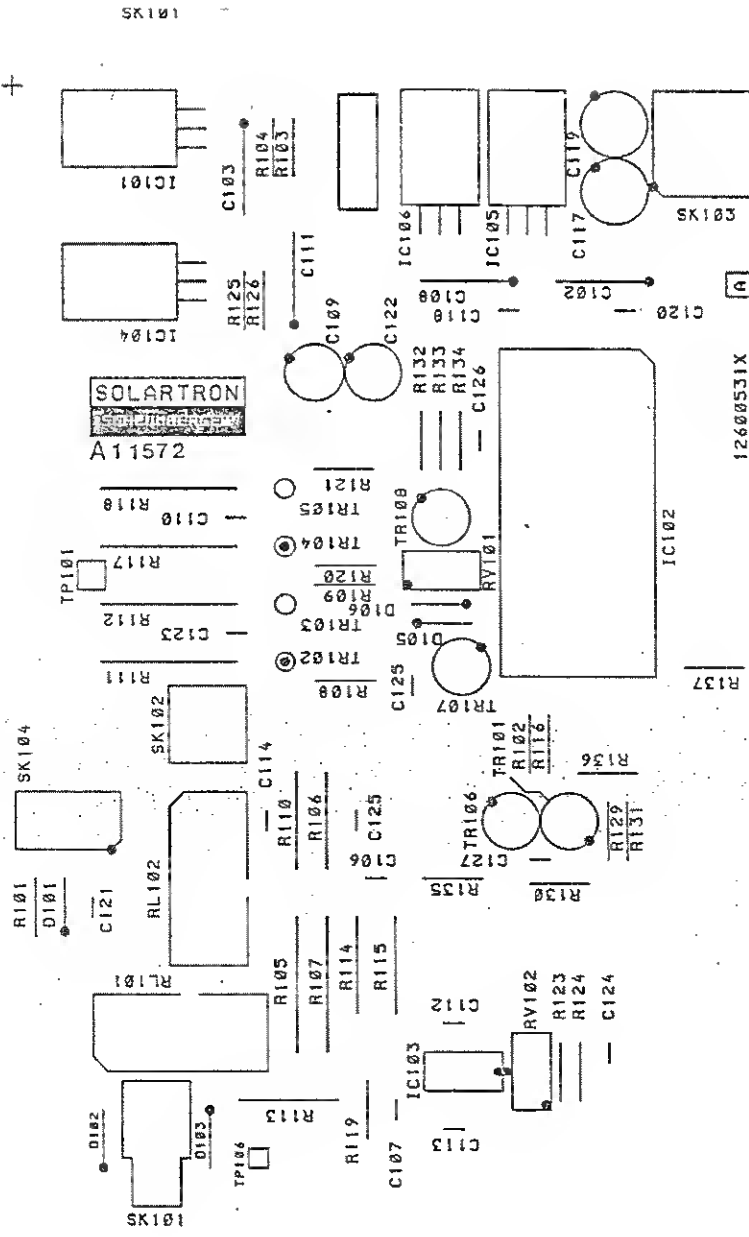
12609518 - D  
SHEET 6 OF 8

MOS DEVICES ARE USED ON THIS BOARD, SILK SCREEN WITH YELLOW PAINT.





12609530 -B  
NOTATION  
SHEET 6 OF 8



12609331-8  
SHEET 4 OF 6  
PCB NOTATION

Diag. 8.11 PCB 31 COMPONENT LAYOUT

# Chapter 9

## 1255 and 1260 Circuit Diagrams

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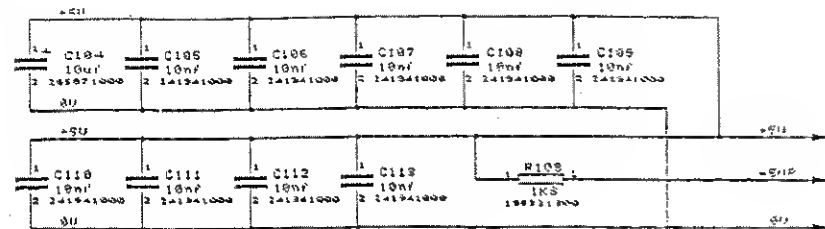
*Diag.*

- 9.1 1260 FRONT PANEL PROCESSOR
- 9.2 1260 FRONT PANEL DISPLAY
- 9.3 FRONT PANEL INVERTER
- 9.4 VOLTAGE ANALYZER
- 9.5 VOLTAGE ANALYZER LOGIC
- 9.6 VOLTAGE ANALYZER POWER SUPPLIES
- 9.7 VOLTAGE ANALYZER INPUT & MIXER
- 9.8 VOLTAGE ANALYZER OVERLOAD DETECTION
- 9.9 VOLTAGE ANALYZER RANGING
- 9.10 VOLTAGE ANALYZER ADC
- 9.11 GENERATOR AMPLIFIER LOGIC
- 9.12 GENERATOR AMPLIFIER EARTHY LINEAR LF
- 9.13 GENERATOR AMPLIFIER EARTHY LINEAR HF
- 9.14 GENERATOR AMPLIFIER FLOATING LINEAR (1)
- 9.15 GENERATOR AMPLIFIER FLOATING LINEAR (2)
- 9.16 GENERATOR AMPLIFIER POWER SUPPLY
- 9.17 GENERATOR AMPLIFIER AGC
- 9.18 GENERATOR (Sheet 1)
- 9.19 GENERATOR (Sheet 2)
- 9.20 GENERATOR (ANALOG)
- 9.21 GENERATOR FLOATING POWER (Sheet 4)
- 9.22 GENERATOR FLOATING POWER (Sheet 5)
- 9.23 HF SYNTHESIZER (Sheet 1)

*Contd.*

*Diag.*

- 9.24 HF SYNTHESIZER (Sheet 2)
- 9.25 HF SYNTHESIZER (Sheet 3)
- 9.26 HF SYNTHESIZER (Sheet 4)
- 9.27 ANALYZER CONTROL (Sheet 1)
- 9.28 ANALYZER CONTROL (Sheet 2)
- 9.29 SYNTHESIZER (Sheet 1)
- 9.30 SYNTHESIZER (Sheet 2)
- 9.31 1260 CPU BOARD (Sheet 1)
- 9.32 1260 CPU BOARD (Sheet 2)
- 9.33 1260 CPU BOARD (Sheet 3)
- 9.34 1260 BINSORT INTERFACE
- 9.35 1260 BOARD 31 I-V CONVERTER



**SOCKETS**

- 16 PIN DIP SOCKET FOR IC105 (380584900)
- 24 PIN DIP SOCKET FOR IC113 (380584910)
- 28 PIN DIP SOCKET FOR IC111 (380585160)
- 48 PIN DIP SOCKET FOR IC101 (380584970)

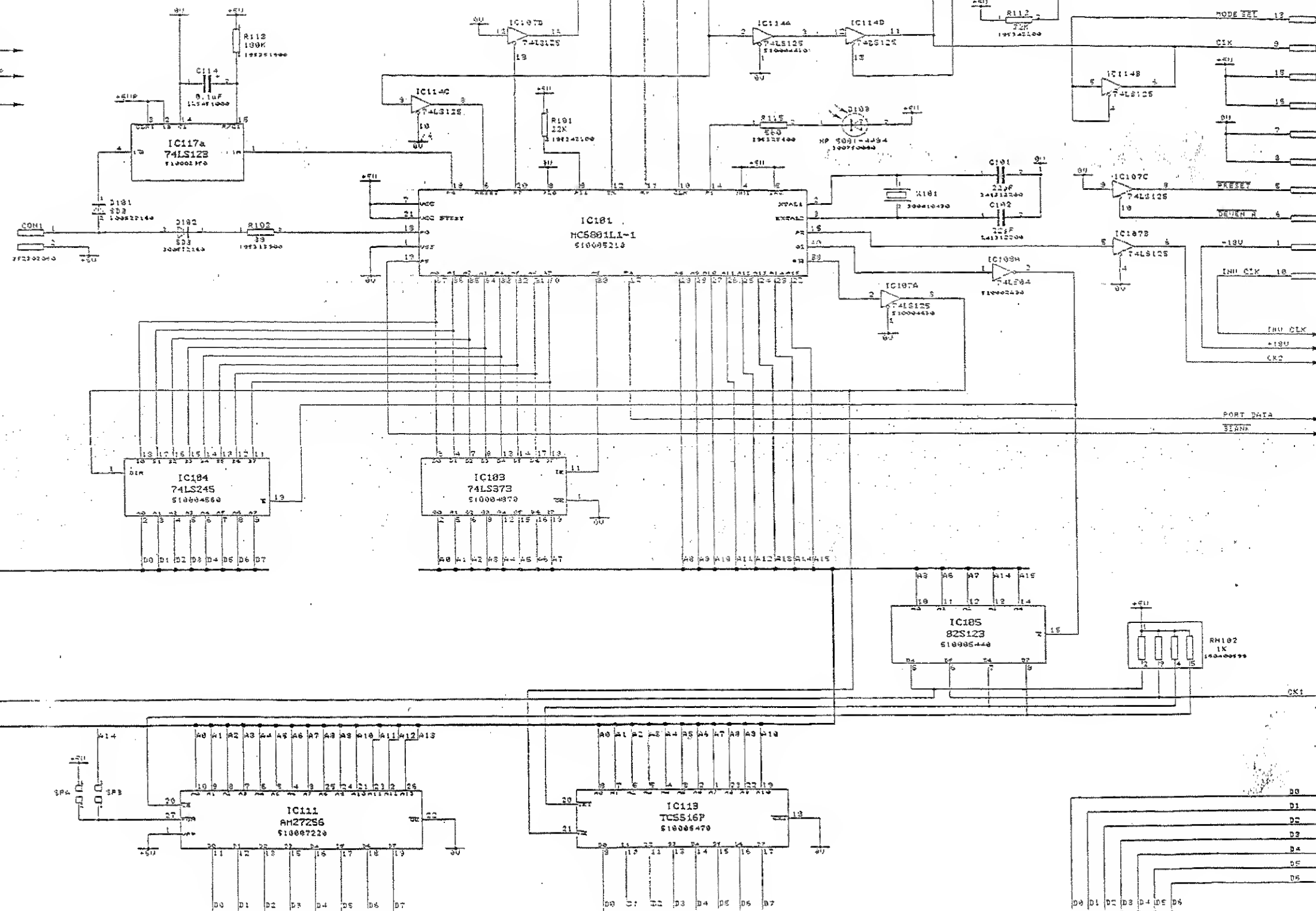
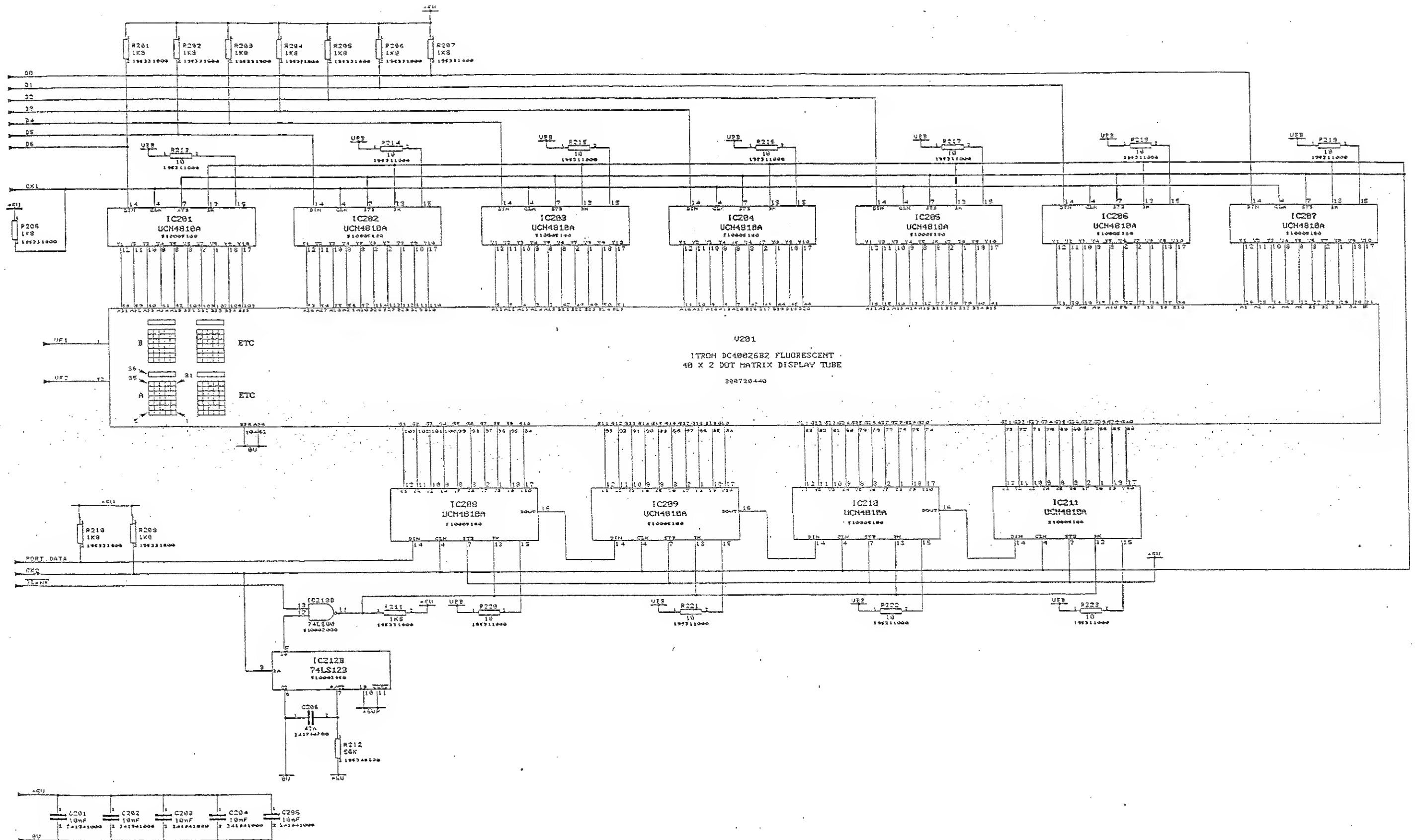


Diagram 9-1 1260 FRONT PANEL PROCESSOR

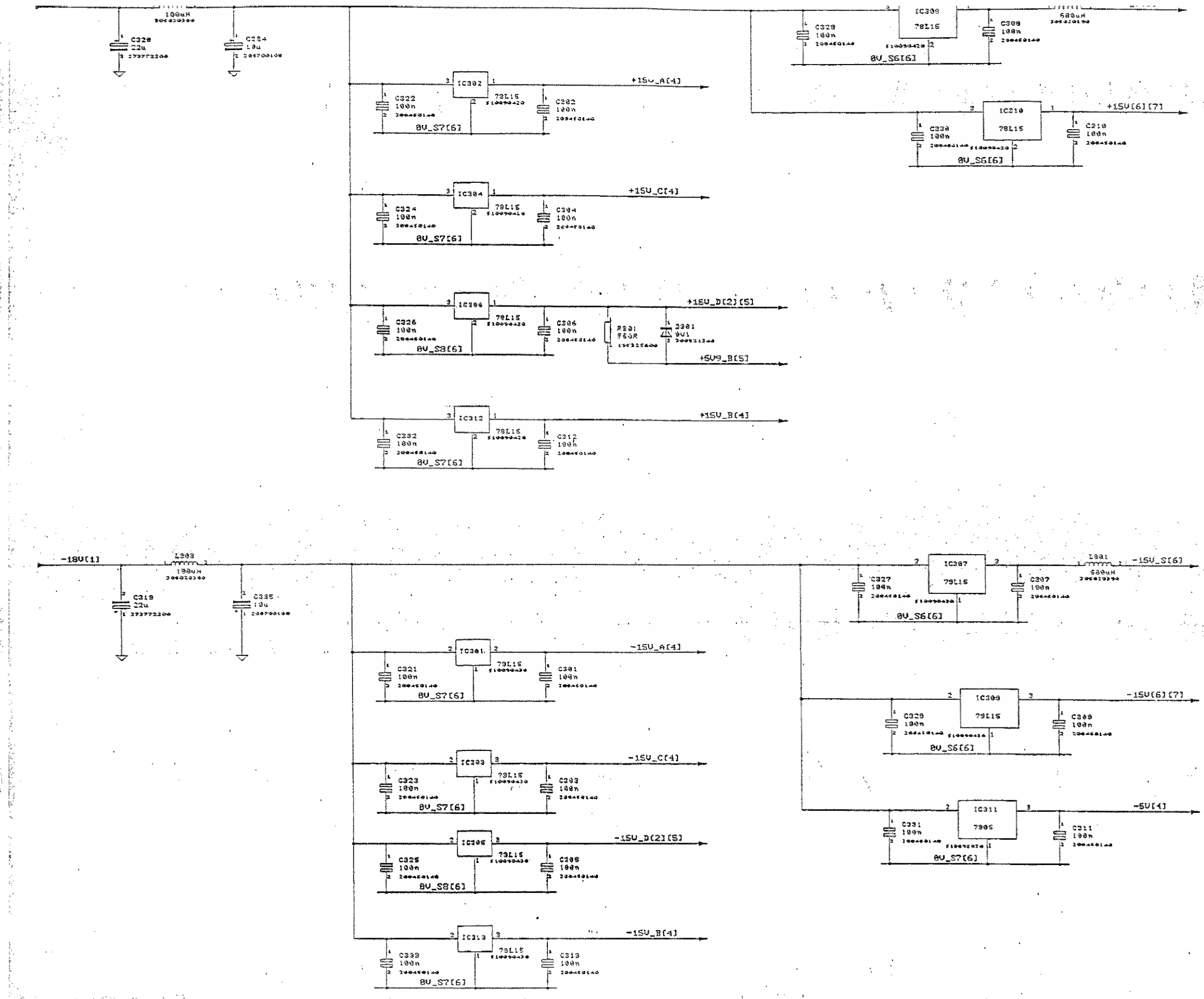


Diaq. 9.2. 1260 FRONT PANEL DISPLAY





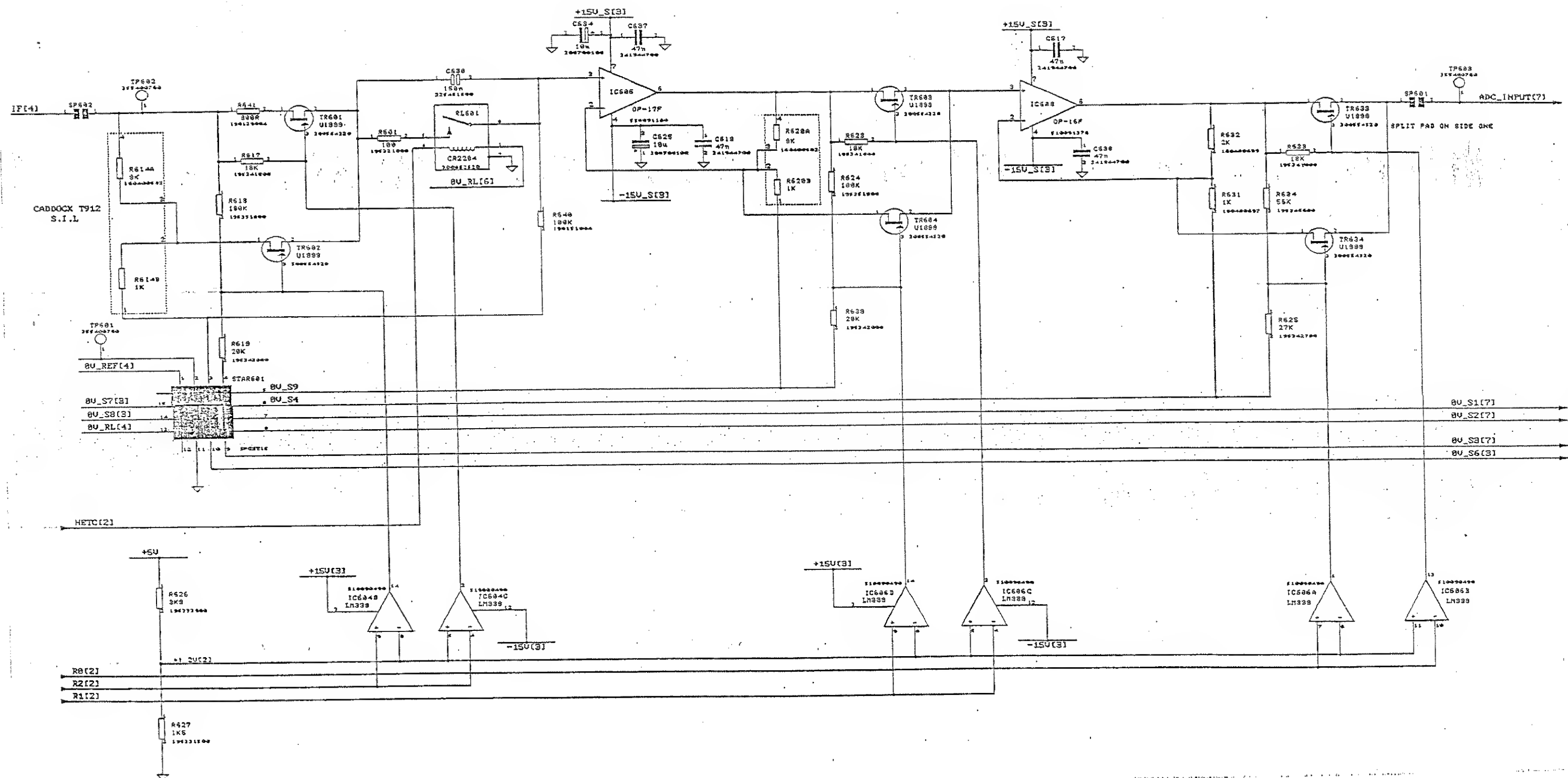




Diag. 9.6 VOLTAGE ANALYZER POWER SUPPLIES



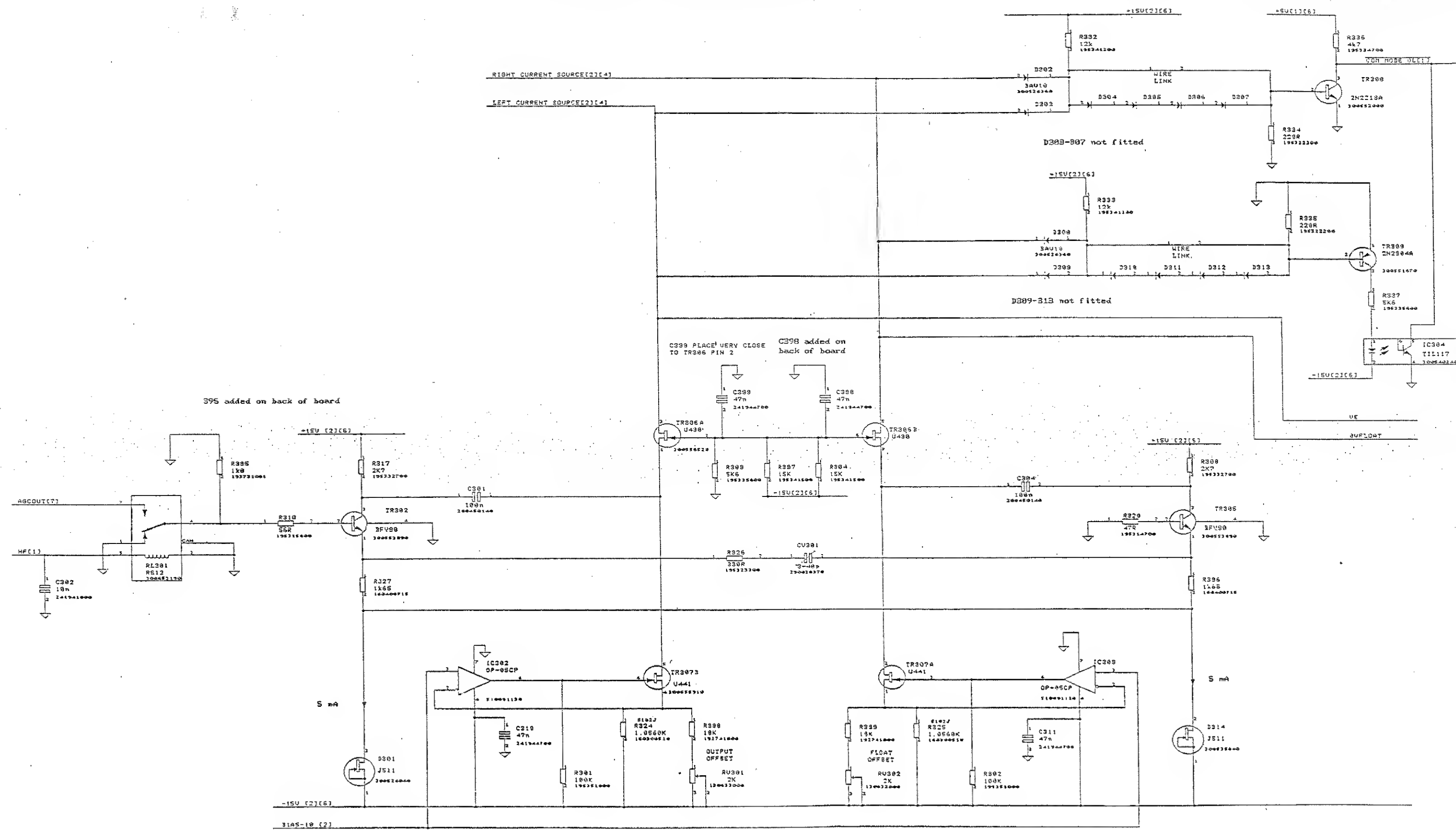








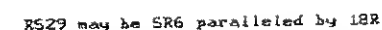




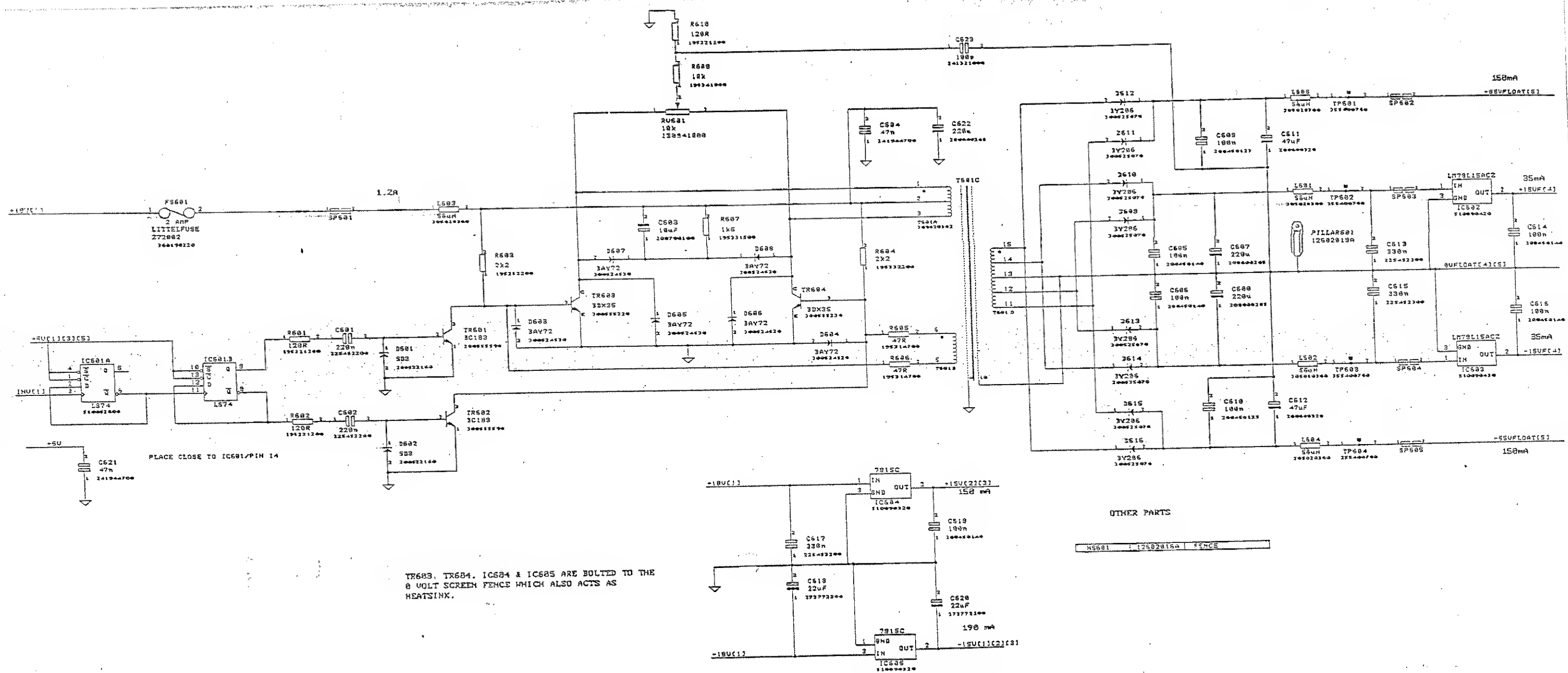
Diag. 9.13 GENERATOR AMPLIFIER EARTHY LINEAR HF



## OTHER PARTS



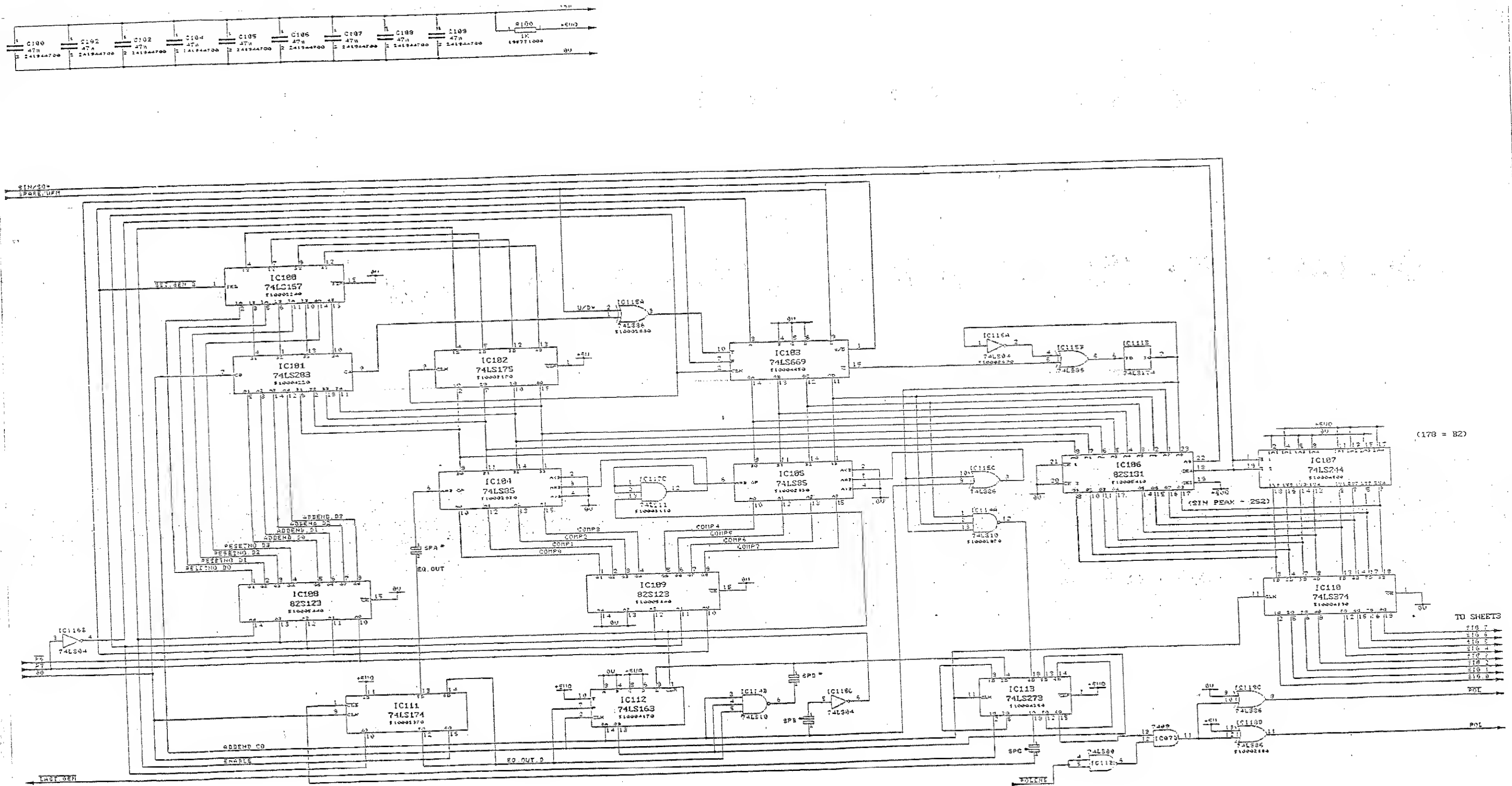
Diag. 9.15 GENERATOR AMPLIFIER FLOATING LINEAR (2)



Diad. 9.16 GENERATOR AMPLIFIER POWER SUPPLY





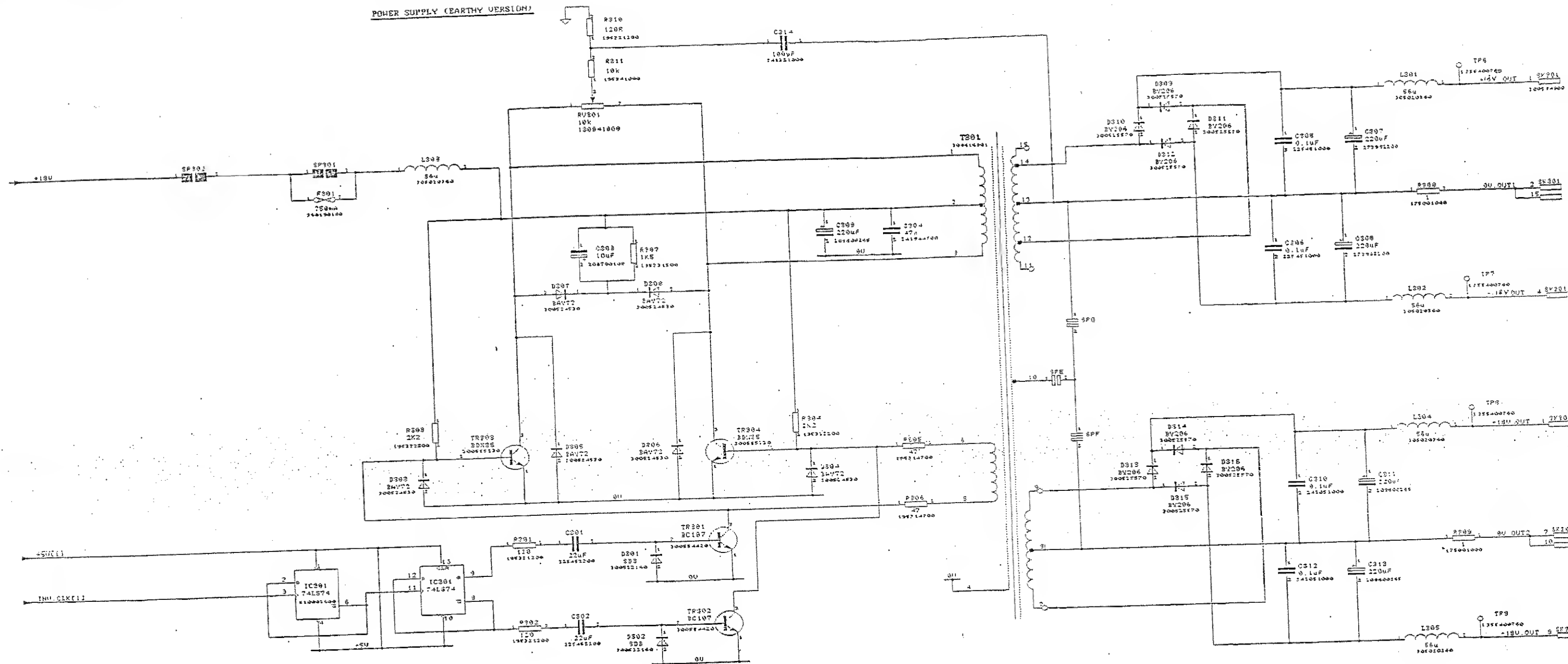


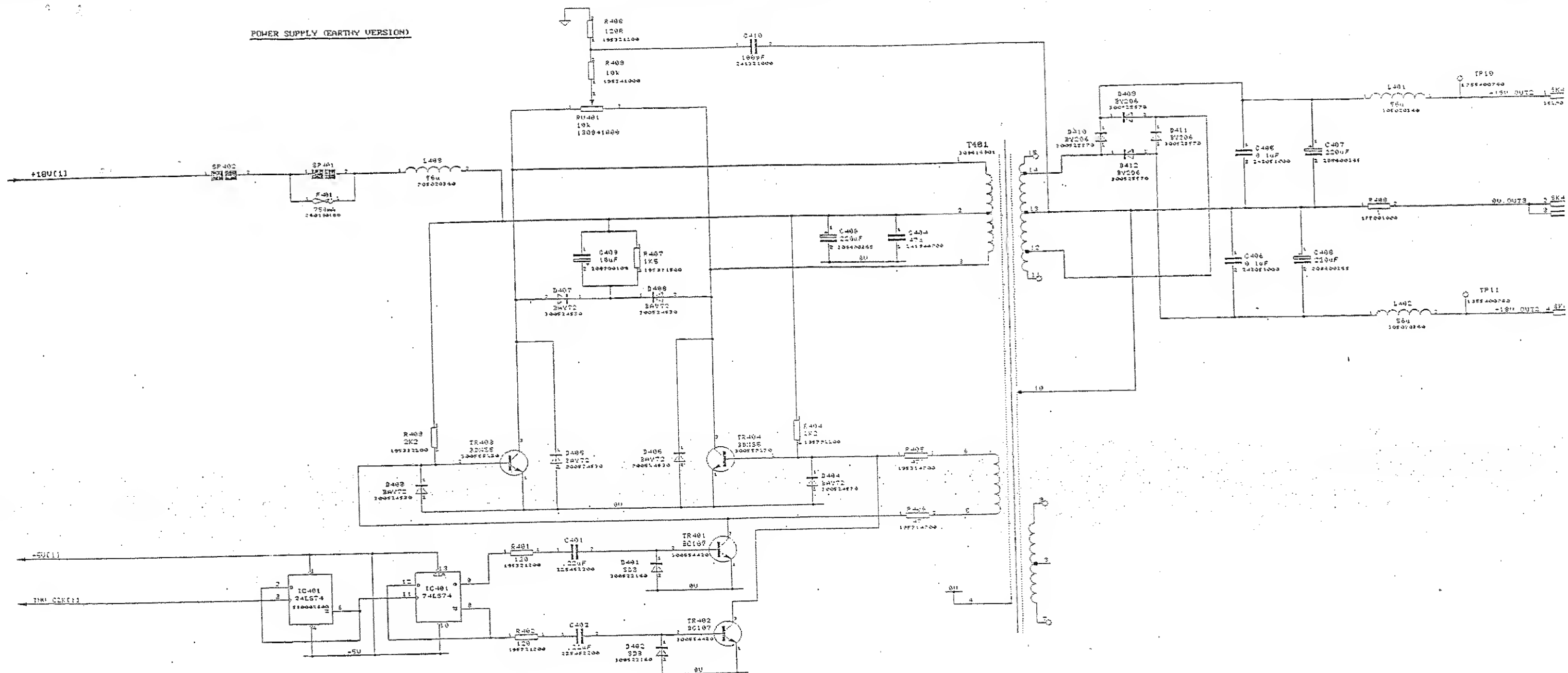
SPARE  
 IC114 C  
 IC115 D  
 IC117 B,C  
 IC118 A,B  
 IC116 D,E,F  
 IC113 C,D,G  
 IC111 A,C,G,H

Diag. 9.19 GENERATOR



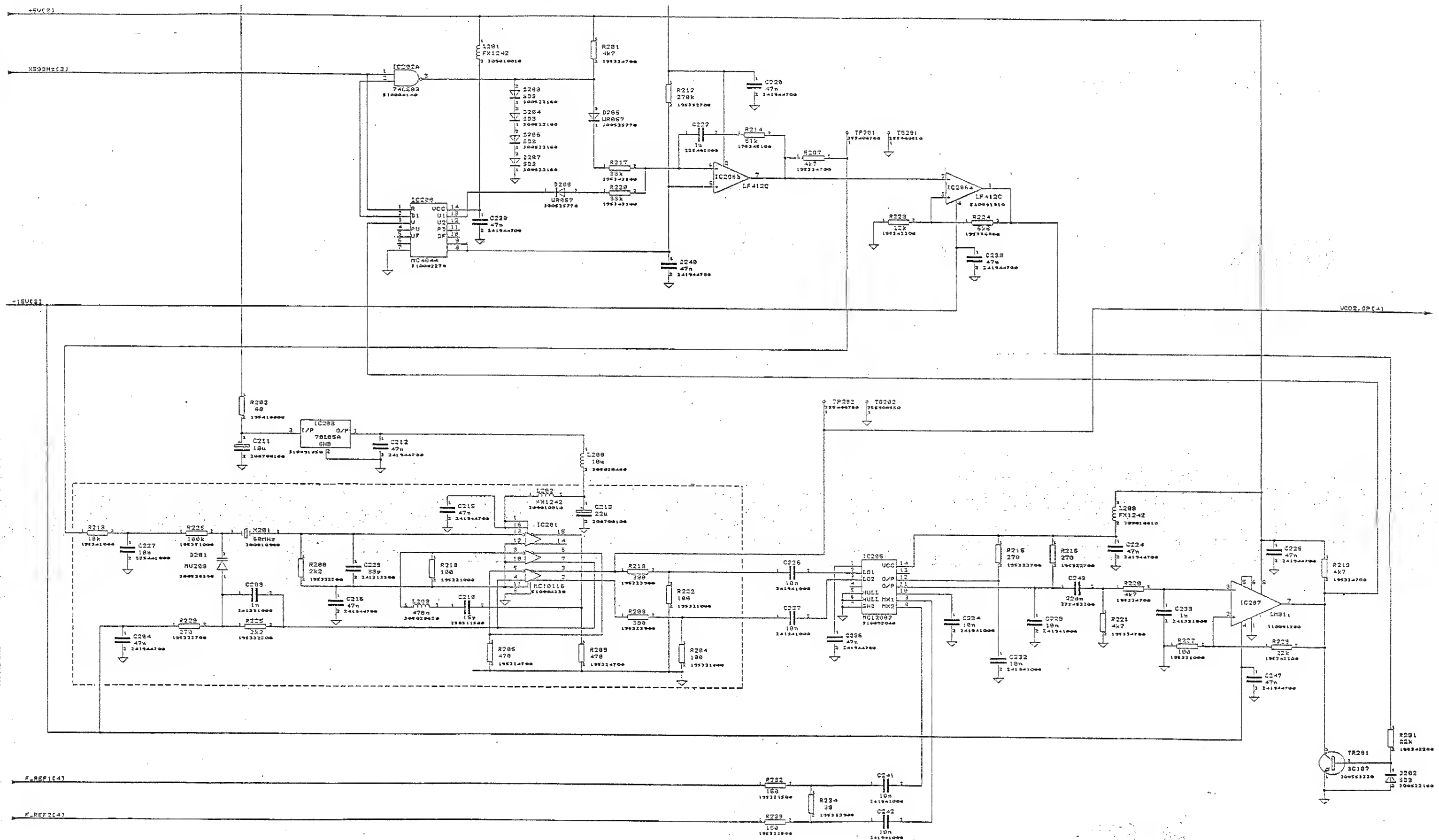
# POWER SUPPLY (EARTHY VERSION)



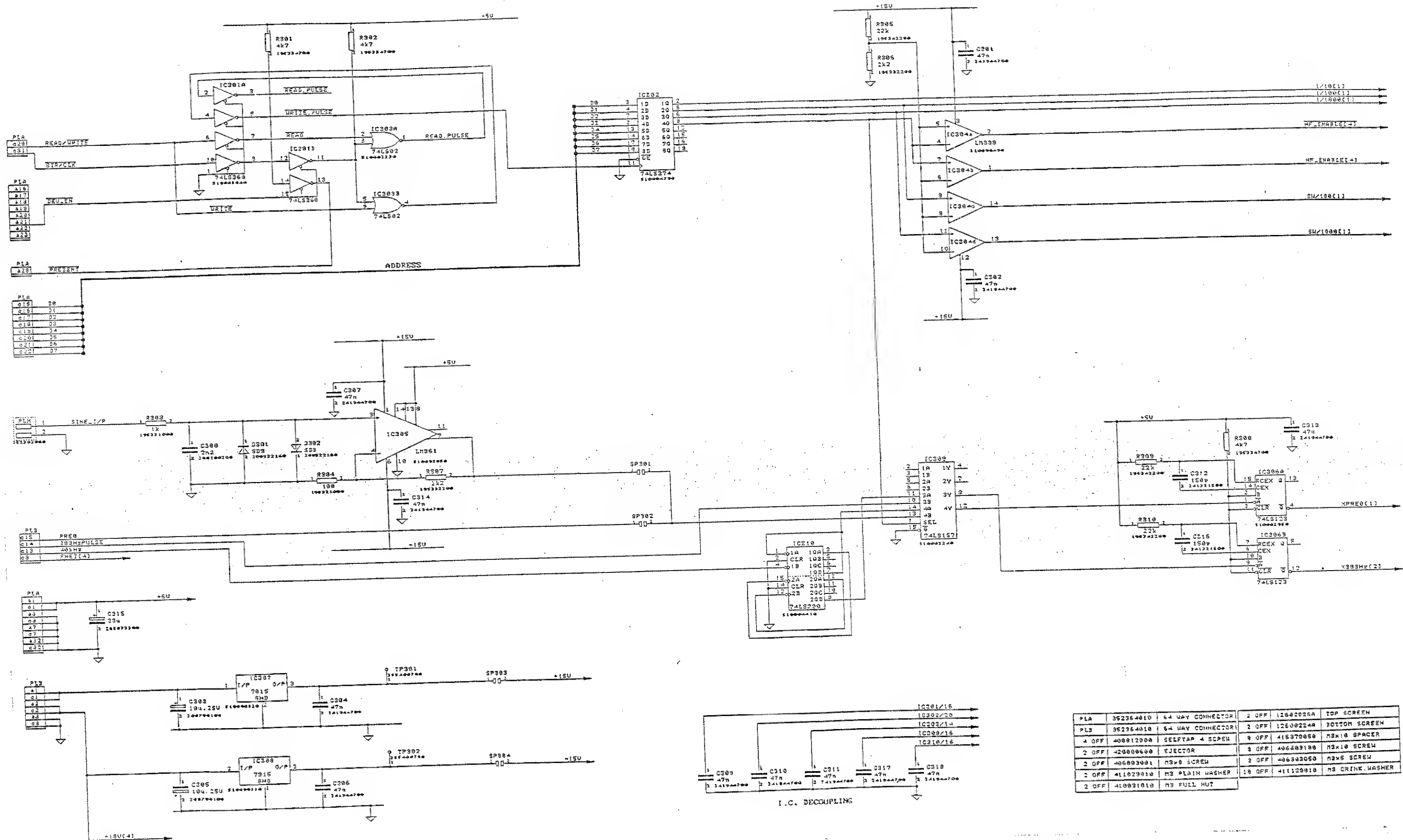


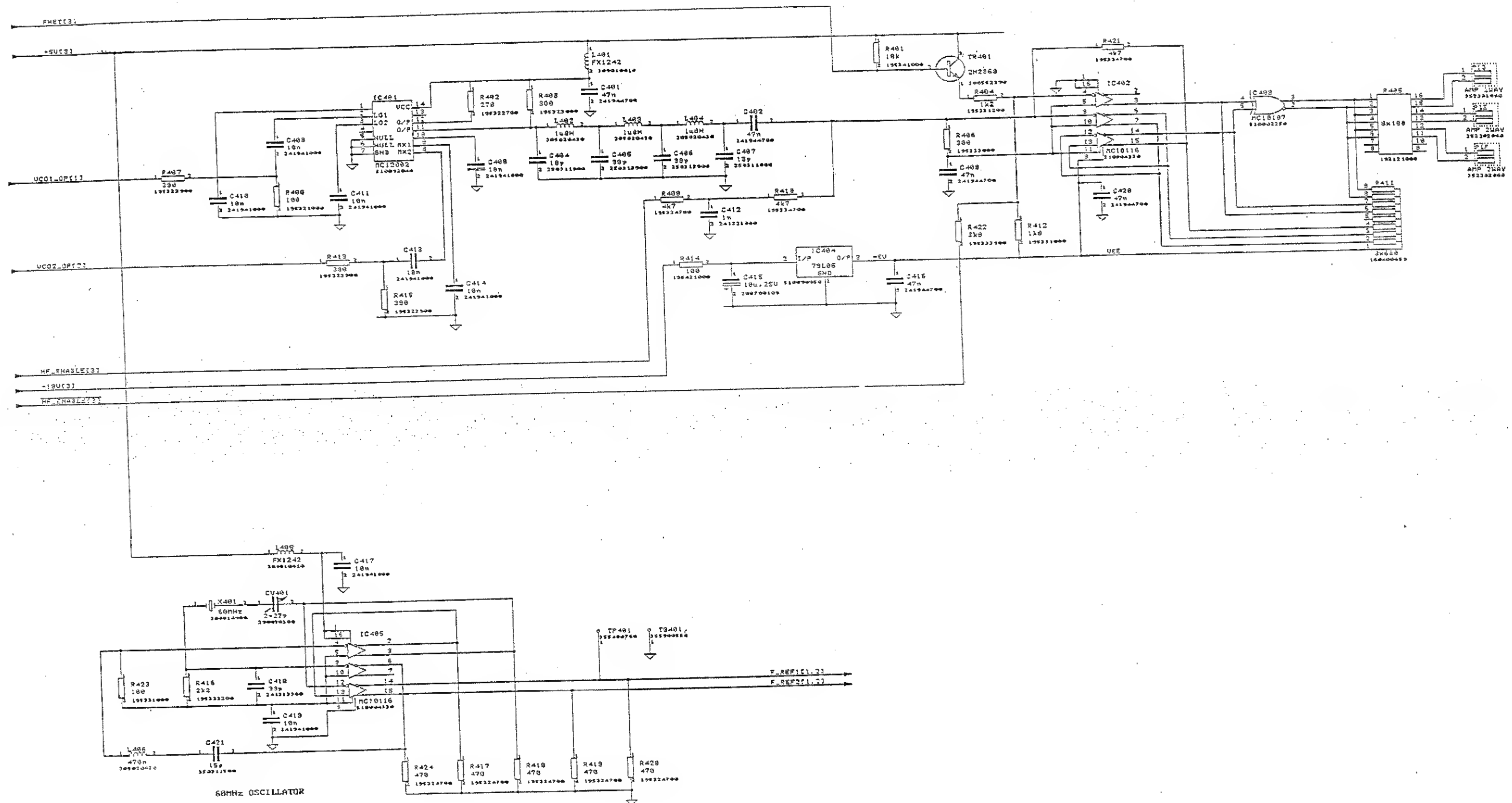
Diag. 9.22 GENERATOR FLOATING POWER  
[Pt. No. 12607515 Iss. D, Sht. 5 of 5]

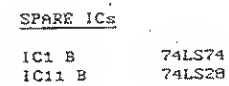


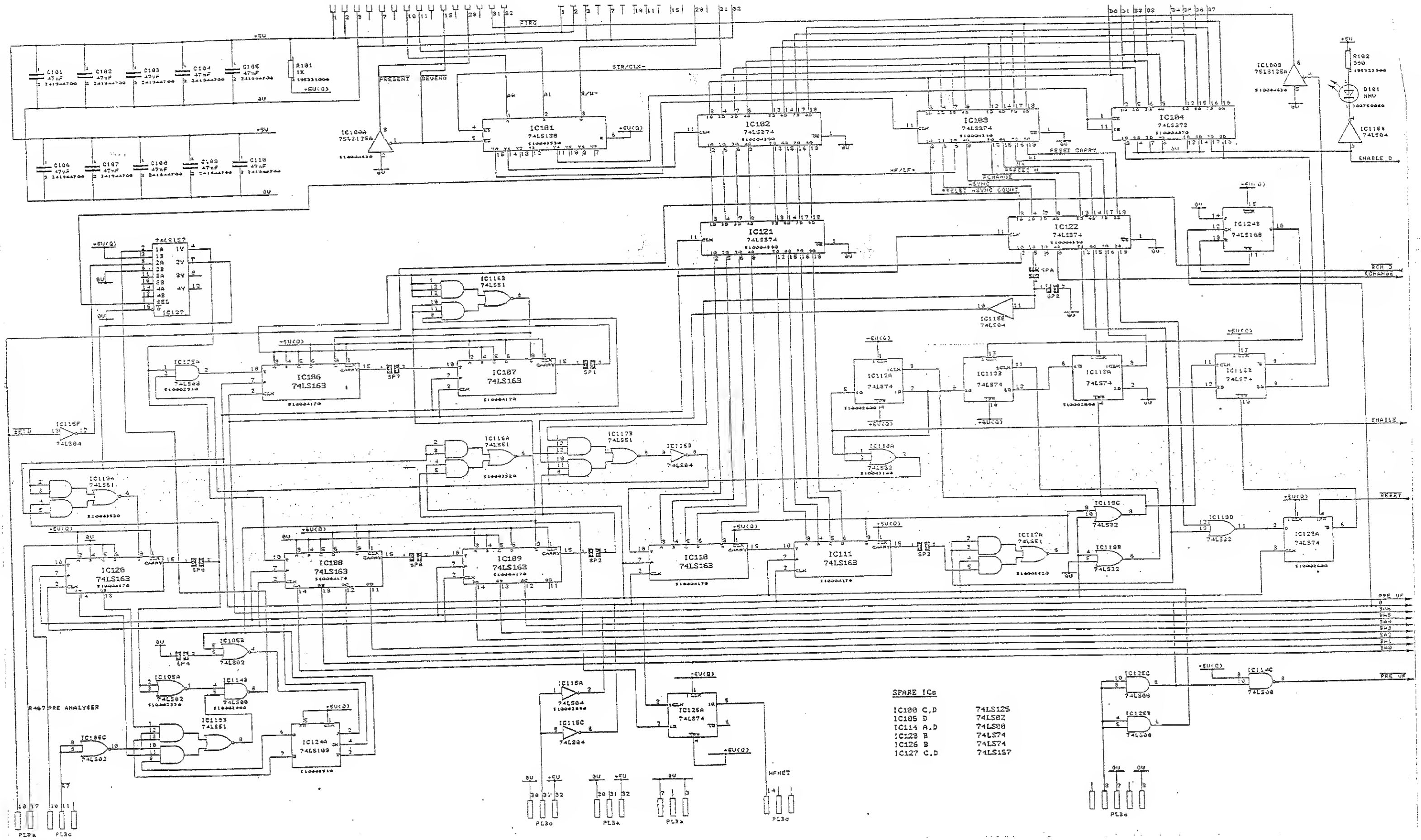


Diag. 9.24 HF SYNTHESIZE

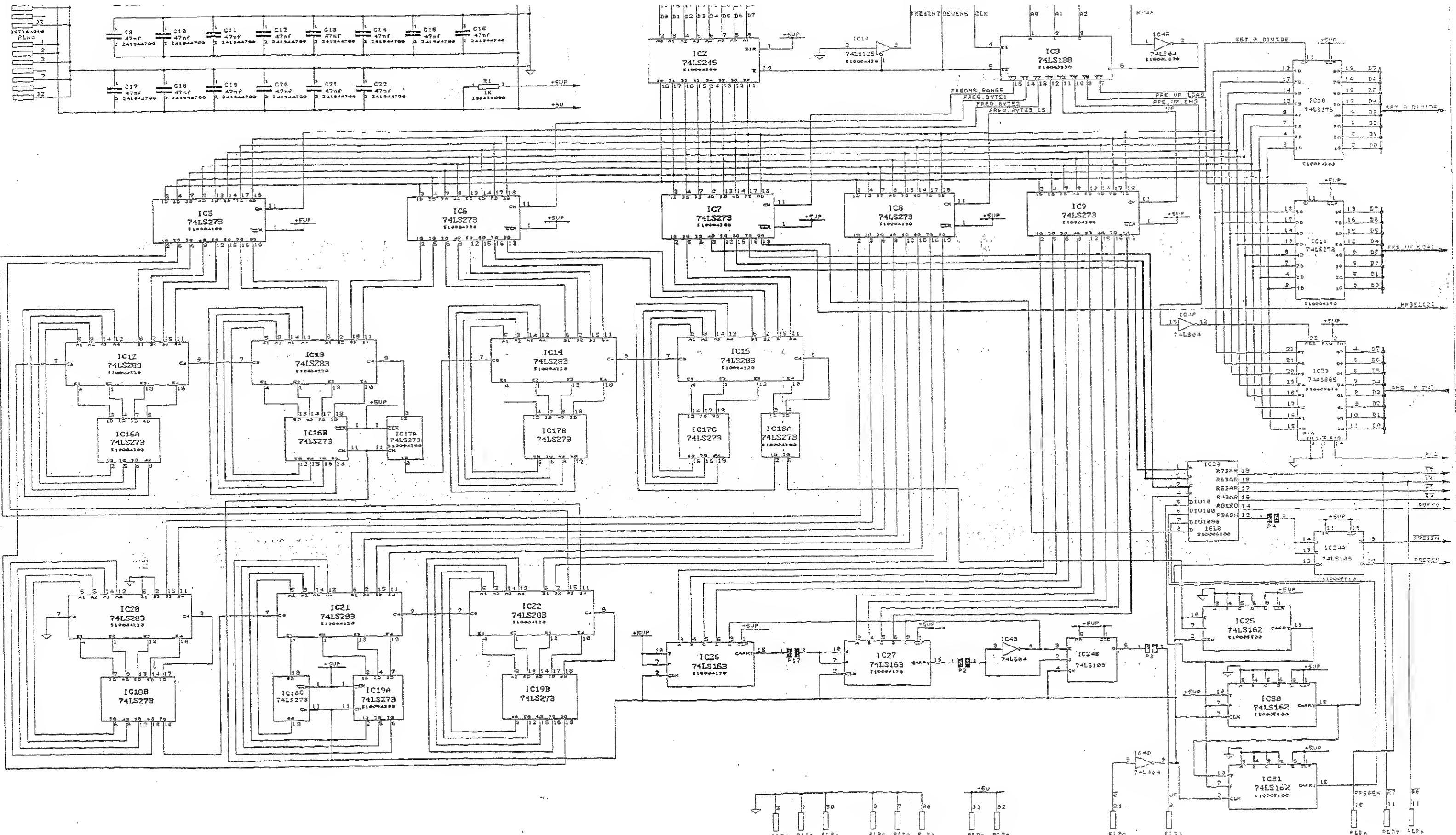






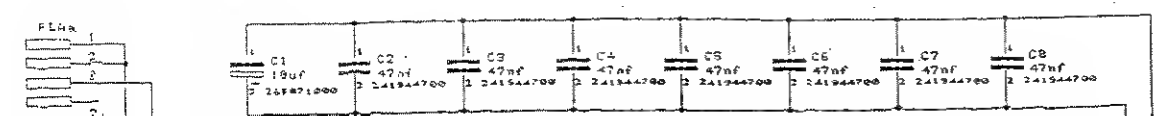


Diag 9.28 ANALYZER CONTROL



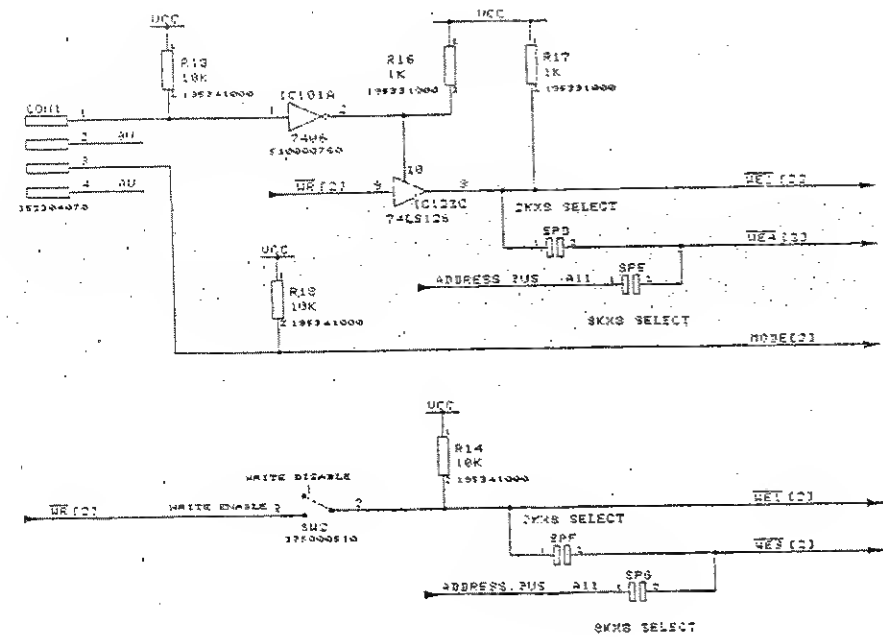
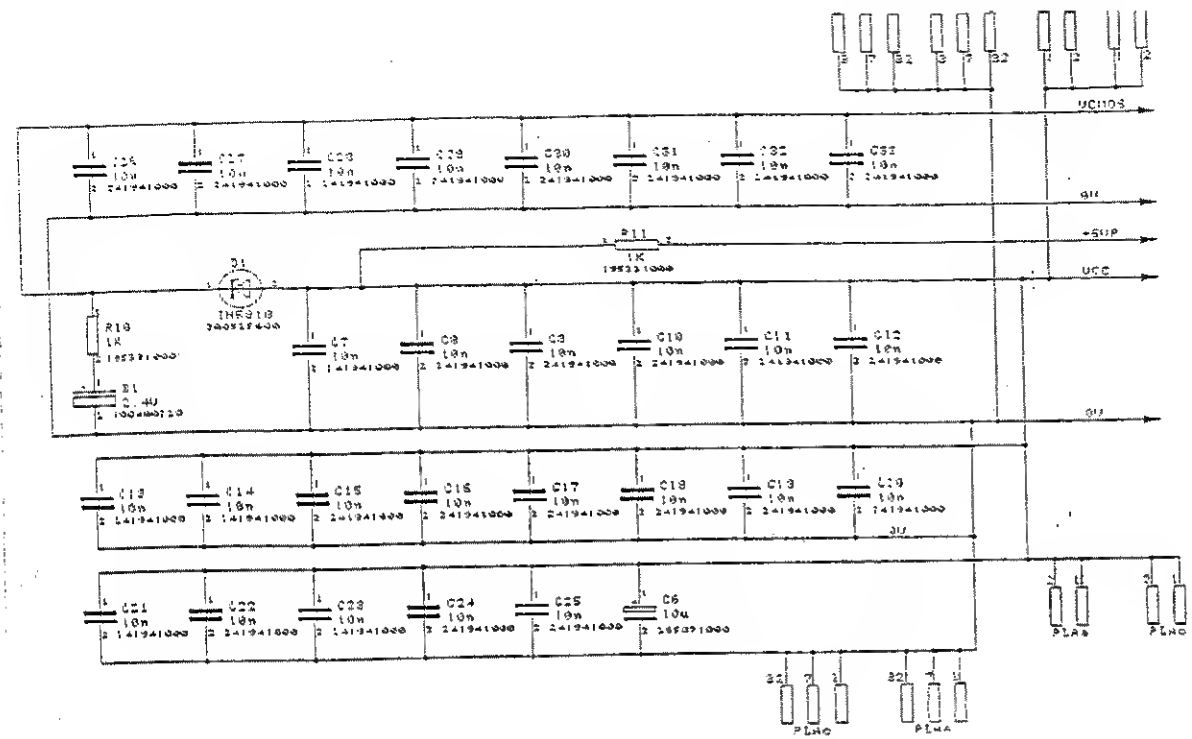
Diag 9.29 SYNTHESIZER

SPARE GATES  
 IC1 B.C.D 74LS125  
 IC4 C.E 74LS04



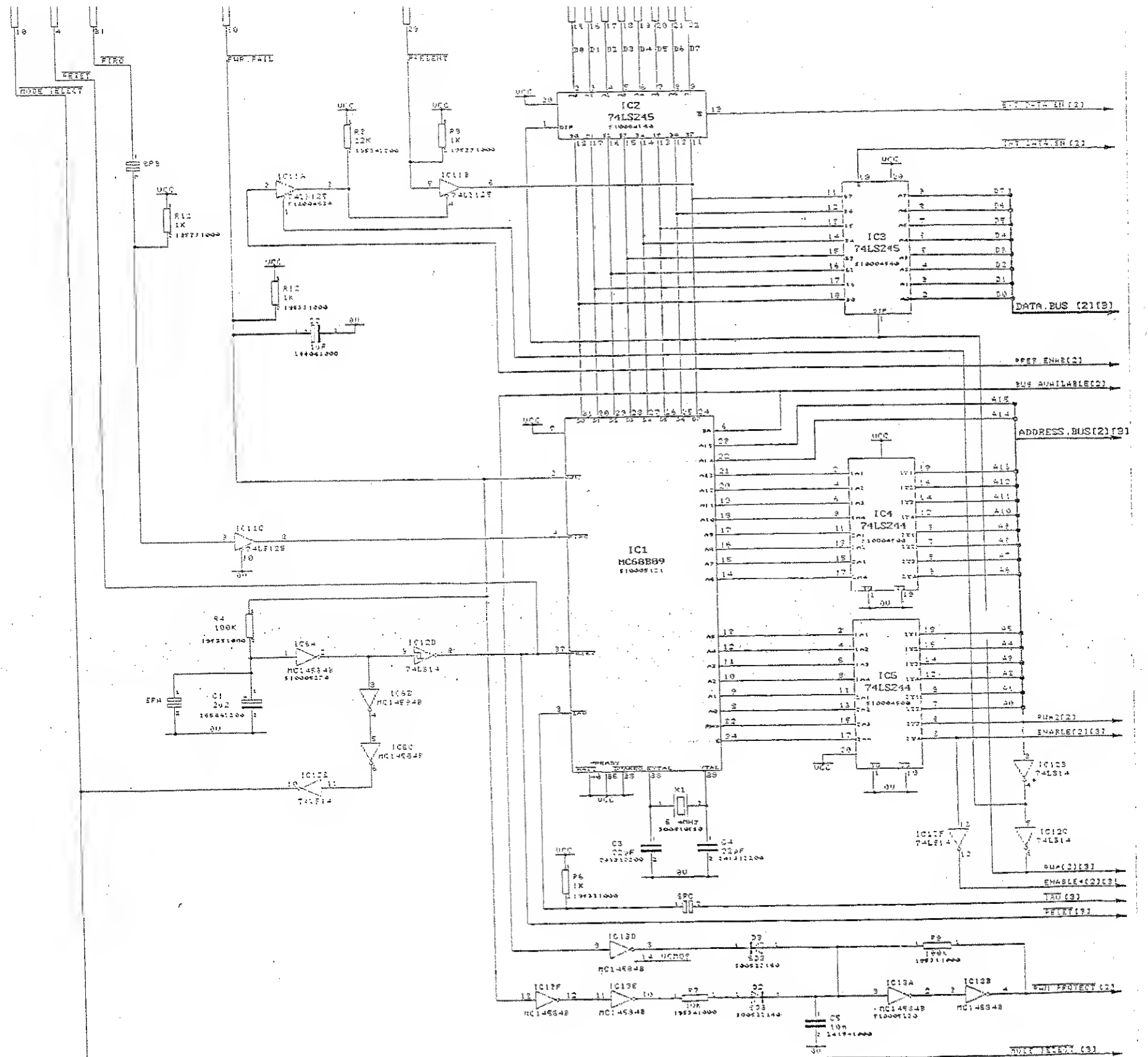


IC111 B	74LS11
IC114 B	74LS51
IC123 B	74LS109
IC177 C.D	74LS07



SOCKETS	
40 PIN DIP FOR IC1, IC113	289524970
16 PIN DIP FOR IC3	200534900
28 PIN DIP FOR IC14, IC15, IC16, IC17, IC18, IC19, IC20, IC21, IC22, IC23, IC24, IC25, IC26, IC27, IC28, IC29, IC30, IC31, IC32, IC33, IC34, IC35, IC36, IC37, IC38, IC39, IC40, IC41, IC42, IC43, IC44, IC45, IC46, IC47, IC48, IC49, IC50, IC51, IC52, IC53, IC54, IC55, IC56, IC57, IC58, IC59, IC60, IC61, IC62, IC63, IC64, IC65, IC66, IC67, IC68, IC69, IC70, IC71, IC72, IC73, IC74, IC75, IC76, IC77, IC78, IC79, IC80, IC81, IC82, IC83, IC84, IC85, IC86, IC87, IC88, IC89, IC90, IC91, IC92, IC93, IC94, IC95, IC96, IC97, IC98, IC99, IC100, IC101, IC102, IC103, IC104, IC105, IC106, IC107, IC108, IC109, IC110, IC111	200534900

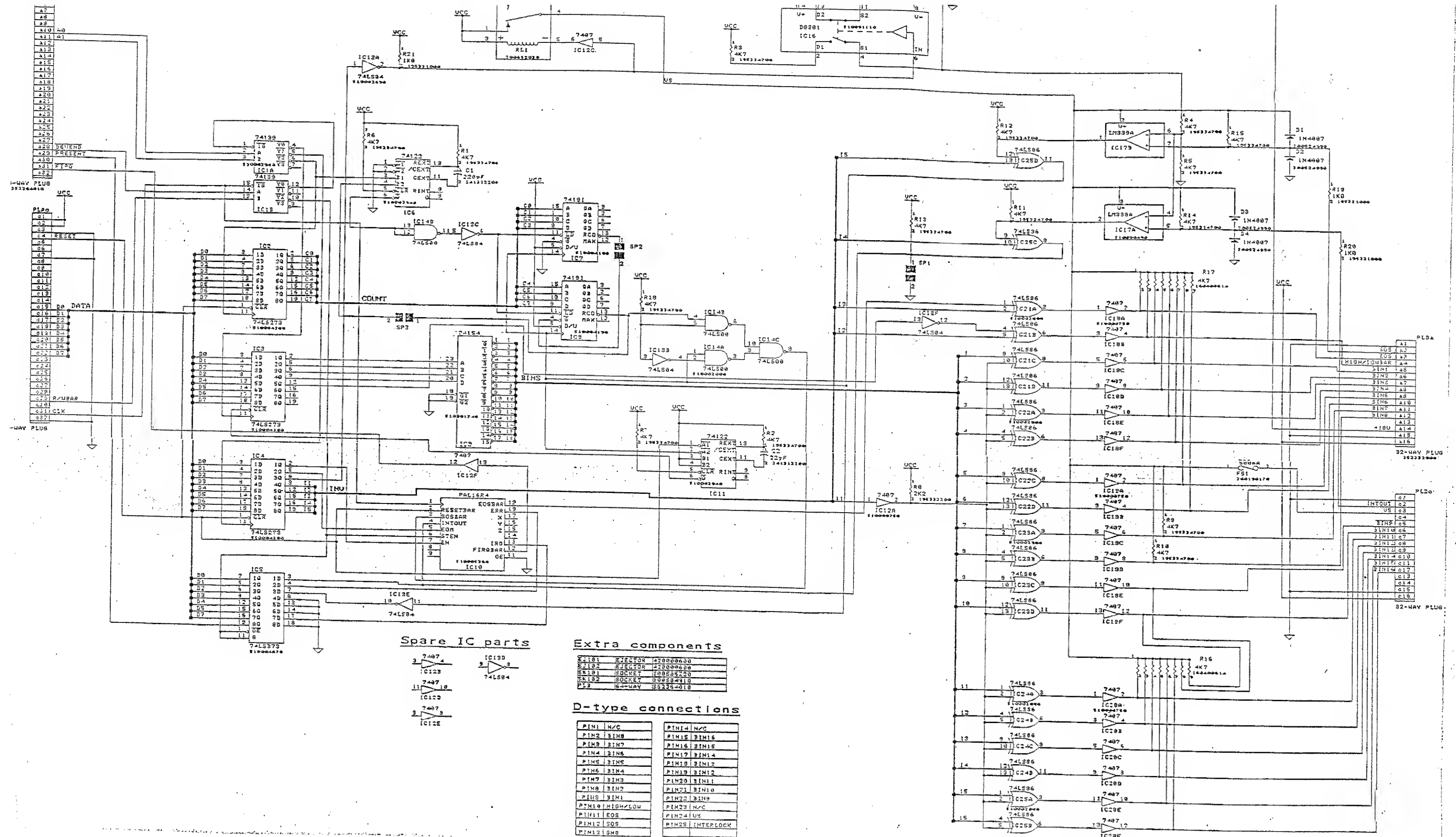
SPARE ICs	
IC120	
IC64, IC65, IC66	
IC116A	
IC117A	
IC118A	



Diag 9.31 1260 CPU BOARD  
[P4] No. 12607522 Ver. F Sht 1 of 3







Diag 9.34 1260 BINSORT INTERFACE



# Chapter 10

## Fault Diagnosis

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2.2 Self-test Failure	10.3
2.3 Analog Failure	

## 1 INTRODUCTION

This chapter contains fault-finding procedures to pcb level.

It is assumed that the top cover of the instrument has been removed (as per Chapter 7) in order to gain access to the boards.

**Note the safety precautions given in Chapter 1.**

## 2 FAULT FINDING

### 2.1 BLANK DISPLAY

If at switch-on the display appears blank, suspect the line fuse, or the dc supplies and fuses. If the supplies are satisfactory, suspect either the Display Board (Pcb 2) the Processor Board Pcb 22, or (if fitted) the Power Fail Detect Board, Pcb 5.

### 2.2 SELF-TEST FAILURE

The self-test procedure checks out the logic circuitry of the instrument. In the event of a failure, it may be difficult to identify the cause precisely due to the interconnections between pcbs. The self-test indications therefore provide only a guide. Usually, a self-test failure indicates a fault on either Pcb 22, Pcb 17 or Pcb 18. (Refer to the section on self-test in the Operating Manual)

If the self-test procedure will not initiate, the Main Processor Board (Pcb 22) may be faulty. First check that the LEDs on the pcb are flashing. If these are operating satisfactorily, check the state of pin 37 on IC1. A Lo on this pin will indicate that Pcb 5 is faulty; similarly, a Hi will indicate that the fault may be on the Display Board (Pcb 2)

### 2.3 ANALOG FAILURE

The self-test procedure will not reveal an analog failure. This type of failure will be reflected in the displayed results. To diagnose an analog fault, proceed as follows:

- a. On Pcb 22, set switches SW1 and SW6 to the down (CAL disabled) position.
- b. Select INITIALIZE from the self-test menu.
- c. Enter a bias value of 10V from the GENERATOR menu.
- d. Press SINGLE and check the generator output.

Q. Is + 10V present?

YES Go to step e.

NO On Pcb 15, measure the voltage of TP 5 wrt TP1.

Q. Is +1.2V present?

YES Fault on Pcb 14, power amplifier (Sheets 4 and 5) or LF section (Sheet 2).

NO Fault on Pcb 15

- e. From GENERATOR menu, set bias to zero and amplitude to 3V.

Q. Is there an undistorted sinewave of 3V amplitude at the Generator output?

YES LF section is satisfactory - go to step f.  
NO On Pcb 15, measure TP4 wrt TP1.

Q. Is an undistorted sinewave of amplitude 3Vrms present?

YES Fault on board 14, LF section (Sheet 2) or power amplifier (Sheets 4 and 5)

NO On Pcb 15, check IC 203, pin 15.

Q. Is an undistorted sinewave of amplitude 5V present?

YES Fault in IC 203 (Amp DAC) area.  
NO Fault on Pcb 15

f. From the GENERATOR menu, enter a frequency of 3kHz.

Q. Is there an undistorted sinewave of amplitude 3Vrms at the Generator output?

YES Repeat step f. for frequencies of 10kHz and 65kHz.  
NO Repeat step e.

On the completion of step f., tests on the three frequency ranges of Pcb 15 and 18 are complete.

g.. From the GENERATOR menu, enter a frequency of 66kHz and 1Vrms.

Q. Is there an undistorted sinewave of amplitude 1Vrms at the Generator output?

YES Go to step h.  
NO On Pcb 14, check the output of IC704, pin 10.

Q. Is there an undistorted sinewave of frequency 66kHz and amplitude 330mVrms present?

YES Pcb 14, HF section faulty (Sheet 3).  
NO Pcb 16 faulty, or Pcb 14 (Sheet 7). - See next Q.

Q. Is there 560mVrms (from Pcb 16 into Pcb 14) at the junction of R701 / SK701 (Pcb 14, Sheet 7).

YES Pcb 16 satisfactory.  
NO Suspect PCB 16.

h. From the GENERATOR menu, enter a frequency of 1MHz

Q. Is there an undistorted sinewave of approximately 1Vrms at the generator output?

YES Repeat step h. using frequencies of 10MHz and 20MHz respectively.  
NO Repeat step g.

When steps a. through h. are completed, the generator synthesizer sections of Pcb 15, 16 and 18 will have been tested

- i. From the SELF-TEST menu, select INITIALIZE.
- j. Connect the generator output to the INPUT V1 (VOLTAGE 1) HI input.
- k. From the GENERATOR menu, enter a frequency of 250Hz and an amplitude of 1V.
- l. Press RECYCLE.

Q. Is the LED on Pcb 17 flashing?

YES Go to step m.  
NO Fault on Pcb 15,17 or 18.

- m. From the DISPLAY menu, enter INPUT V1 (VOLTAGE 1) as the source and R,0 as the co-ordinates.

Q Does the display read 1V, 0 deg.?

YES Go to step n.  
NO Fault on Pcb 10 or 17. Try Channel 2.

- n. From the GENERATOR menu, enter a frequency of 3kHz.

Q. Does the display read 1V, 0 deg.?

YES Repeat step n. but with frequencies of 10kHz and 65kHz.  
NO F HET signal missing or at incorrect frequency. Fault may be on Pcb 16, 17 or 18.

The satisfactory completion of tests i. through n. will confirm the status of the digital heterodyne circuit.

- o. From the GENERATOR menu, enter a frequency of 66kHz.

Q. Does the display read 1V, with an arbitrary phase angle (0 through 360 degrees)?

YES Repeat tests i. through o. for the INPUT V2 (VOLTAGE V2) input.  
NO Fault on Pcb 17, Pcb 18, or channels 1 and 2. Check signal at TP402 on Pcb 10 is approximately 5.5Vpp at 400Hz. If frequency is incorrect, suspect heterodyne drive from Pcb 16.

1260 Only:

- p. Press RECYCLE.

Q. Does the display read 20mA at an arbitrary phase angle?

YES Repeat steps n. through o.  
NO Pcb 10 faulty.

- q. Disconnect Pcb 31 from the third Pcb 10 input and connect V1 input cable to third Pcb 10. Repeat tests i. through o. with the current input channel on the 60mA range.

Q Does the display read 20mA?

YES Go to next test.  
NO Fault on Pcb 17 or Channel 3.

- r. Isolate Pcb 31 from Pcb 10 by disconnecting SK102. Connect the generator output to the front panel current input and set the generator to : 300Hz , 20mA, Display I, and Rθ.

Q. Is the output of Pcb 31 at SK102, 1V at 300Hz?

YES Reconnect SK102 (Pcb 31 to Pcb 10).  
NO Pcb 31 faulty.